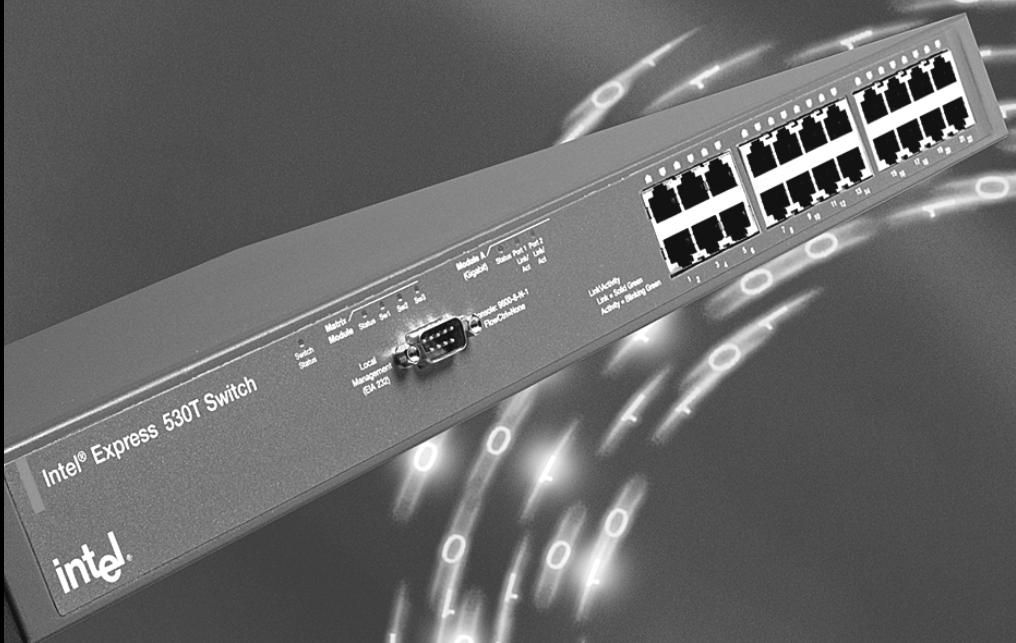


# Intel® Express 530T Switch

## User Guide



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# 1

# Setting up the Intel® Express 530T Switch

## Overview

This guide provides information on configuring and managing the Intel® Express 530T Switch and is organized into these chapters:

- Chapter 1 - Information on the switch hardware and optional modules
- Chapter 2 - Information on using the switch in a LAN and advanced features such as link aggregation and Virtual LANs (VLANs)
- Chapter 3 - How to use Intel Device View
- Chapter 4 - How to use Web Device Manager
- Chapter 5 - Overview of Local Management

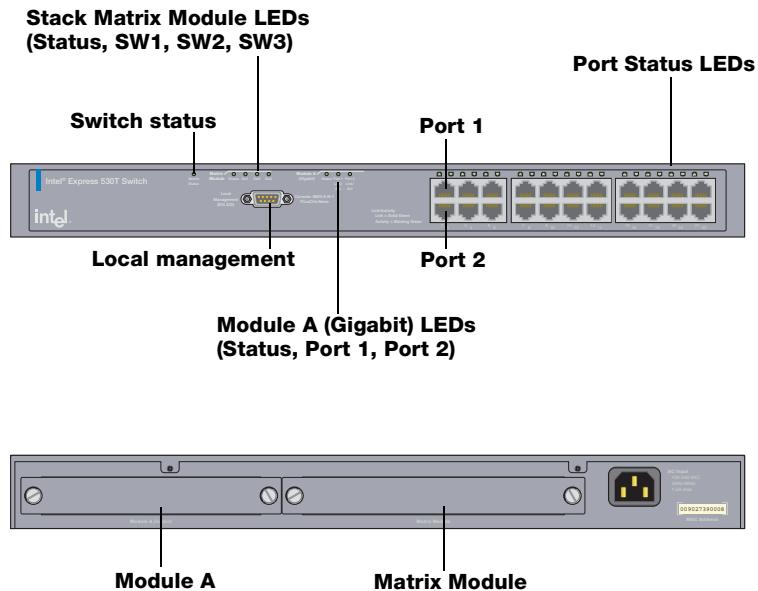
## Management

Through the switch's built-in management you can configure the device and monitor network health. There are several methods for managing this switch; you can use one method or any combination.

- **SNMP management applications** such as Intel® Device View, LANDesk® Network Manager, or HP OpenView\* are tailored for Intel products and show a graphical representation of the device (with the use of the proper MIB).
- **Onboard management** allows control over the device without using an SNMP application. The Web Device Manager provides a graphical interface; Local Management is a menu-driven interface.
- **Other SNMP-compliant applications** can manage 530T switches if you compile the switch's MIB files into that application.

## Switch Features

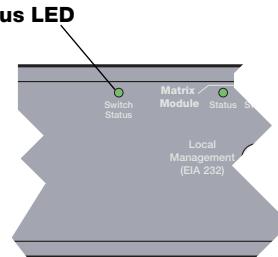
These are the major features of the 530T switch.



- 
- Auto-negotiates speed, duplex, and flow control—10Mbps or 100Mbps *per port*.
  - Half- and full-duplex flow control.
  - Two-port expansion slot for the optional 1000Base-SX, 1000Base-LX, or 100/1000Base-T module.
  - Can be stacked with up to three 535T (member) switches.
  - Port settings can be configured manually through management.
  - Access menu-driven Local Management through the serial port or a Telnet session.
  - Access the graphic, Web-based, Web Device Manager through a Web browser.
-

## Status LED

The Status LED is located to the left of the Matrix Module LEDs.



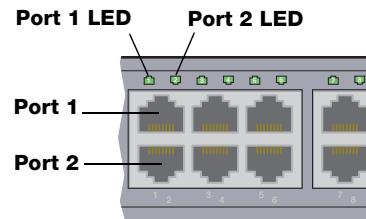
### NOTE

When the switch is first powered on the Status LED is red for a couple of seconds before the diagnostic mode starts, then it turns orange.

LED	Status	Meaning
Status	Orange	Switch is performing diagnostics.
	Green	Diagnostics have passed, the switch is ready.
	Red	Diagnostics have failed.

## Port LEDs

The LEDs above each port indicate port status and port activity.



LED	Status	Meaning
Left (Upper port)	Solid green	Device linked.
	Blinking green	Receiving traffic on that port.
	Off	No link detected.
Right (Bottom port)	Solid green	Device linked.
	Blinking green	Receiving traffic on that port.
	Off	No link detected.

## About the 530T Switch

### General

- The 530T switch is capable of auto-negotiating port speed and can operate at 10Mbps or 100Mbps per port. The switch matches the highest possible speed of an attached device.
- The 530T switch is capable of auto-negotiating port duplex and can operate at half- or full-duplex.

### Cabling

- Use Category 5 or greater unshielded twisted-pair (CAT 5 UTP) cable when connecting 100Mbps devices to the switch.
- Use Category 3, 4, or 5 unshielded twisted-pair (CAT 3, 4, or 5 UTP) cable when connecting 10Mbps devices to the switch.
- Limit the cable length between devices to 100 meters (328 feet).
- Use a straight-through cable to connect the switch to a server or workstation. For more information on cabling, see pages 7 and 8.

## Modules

The 530T switch accepts a Stack Matrix Module to connect with up to three member switches and an uplink module (Module A) to provide an additional two Gigabit ports.

The four modules supported by the 530T are:

- Stack Matrix Module (Connects to a maximum of three 535T [member] switches.) (ES530MSM)
- 1000Base-SX (ES530MSX)
- 1000Base-LX (ES530MLX)
- 100/1000Base-T (ES530MT)

**NOTE**

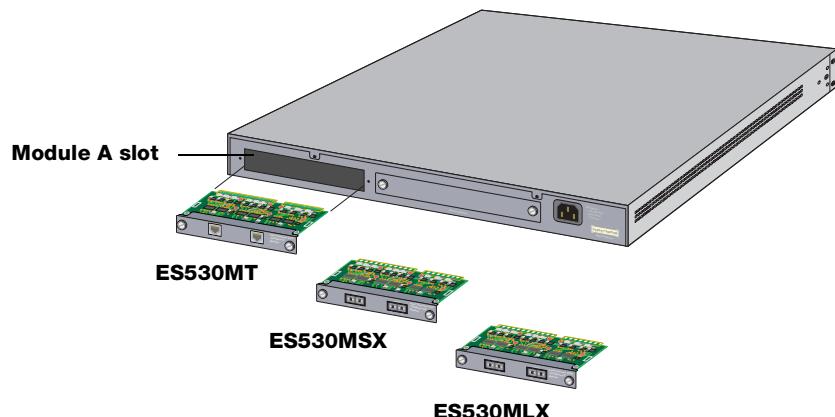
Install the Stack Matrix Module in the slot labeled Matrix Module.

## Installing a Module

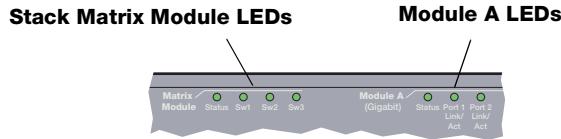
You can install only gigabit modules in the Module A slot located at the back of the 530T switch. Use the LEDs on the front of the switch to check the module's status.

### Install the module in the switch

- 1 Unplug the power cord from the switch. Remove the panel from the expansion slot labeled Module A.
- 2 Align the module with the card guides inside the switch and slide the module into the slot. Press firmly to connect the module and secure it with the retaining screws.
- 3 Plug in the power cord.



## Module LEDs



### Stack Matrix Module LEDs

LED	Status	Meaning
Status	Off	No module present.
	Solid green	Module present.
SW1, SW2, SW3	Off	No link detected.
	Solid green	Switch connected to stack.

### Module A (Gigabit) LEDs

LED	Status	Meaning
Status	Off	No module present.
	Solid green	Module present.
Ports 1, 2	Off	No link detected.
	Solid green	Device linked.
	Blinking green	Link with traffic.

#### NOTE

The 1000SX and 1000LX modules connect at only 1000Mbps and full-duplex.

## Configuring Modules

Normally you do not need to make any changes to the optional modules because they are designed to configure themselves automatically for the attached device. However, you might need to configure the modules in order to communicate with older devices. You can use the Local Management or Web Device Manager to configure the 1000SX, 1000LX, or 1000T modules.

## Media Requirements

Incorrect cabling is often the cause of network performance problems. Read the next two pages to make sure your cabling is correct.

### NOTE

100 meters = 328 feet  
 200 meters = 656 feet  
 500 meters = 1640 feet  
 2 km = 2000 meters = 6560 feet  
 5 km = 5000 meters = 16400 feet

### 10Base-T

The 10Base-T Ethernet specification allows you to use CAT 3, CAT 4, or CAT 5 UTP cabling. The limit is 100 meters between any two devices.

### 100Base-TX

The 100Base-TX Fast Ethernet specification requires that you use CAT 5 UTP cabling to operate at 100Mbps. If you use lower grade cabling (CAT 3 or CAT 4) you may get a connection, but also experience data loss or slow performance. You're limited to 100 meters between any two devices.

### 1000Base-T

The 1000Base-T Gigabit specification requires that you use CAT 5 UTP cabling to operate at 1000Mbps. If you use a lower grade cabling you will experience either no connection or extreme data loss. The maximum distance between any two devices is 100 meters.

### 1000Base-SX/1000Base-LX

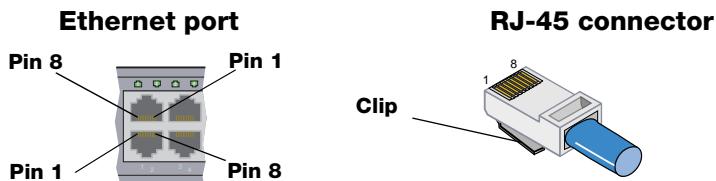
The optional 1000Base-SX and -LX Gigabit Modules provide a high-speed connection to another device up to 5 km away. The maximum distance depends on the type of cable used. Refer to the following table for a list of cable types and maximum distances. Use cables with an SC-type fiber optic connector.

### Selecting the right cable

Media Type	Cabling Used	Maximum Distance
1000/100Base-T (Gigabit) Module	Category 5 (CAT 5) unshielded twisted pair cable	100m
1000Base-SX (Gigabit) Module	50/125 µm multimode 62.4/125 µm multimode	550m 260m
1000Base-LX (Gigabit) Module	50/125 µm multimode 62.4/125 µm multimode 9/125 µm singlemode	550m 550m 5,000m

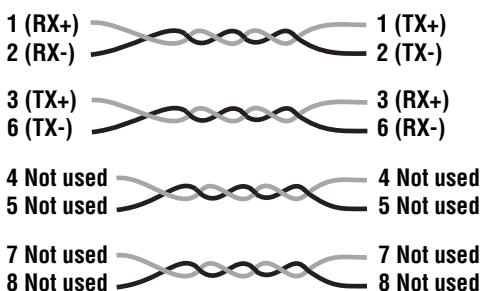
## Straight-through vs. Crossover Cable

Switch ports are wired MDI-X, so use a straight-through cable to connect to a workstation or server (network adapter cards are wired MDI). To connect to another MDI-X port, use a crossover cable. Here are the pin arrangements for the switch's Ethernet port and the typical RJ-45 connector.



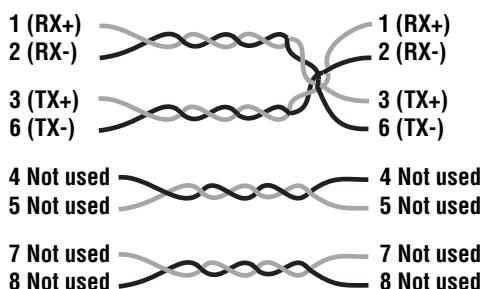
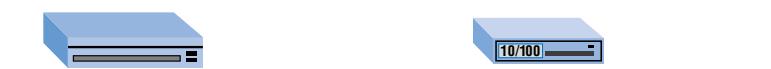
**Straight-through UTP cable (for 100Base-TX)**

Switch (MDI-X)                          Adapter (MDI)



**Crossover UTP cable (for 100Base-TX)**

Switch (MDI-X)                          Hub (MDI-X)



### NOTE

Pairs 4/5 and 7/8 are RX/TX when operating at 1000Mbps.

## Stacking

The 530T switch can be stacked with up to three 535T switches. Stacking allows for a single point of management for all switches.



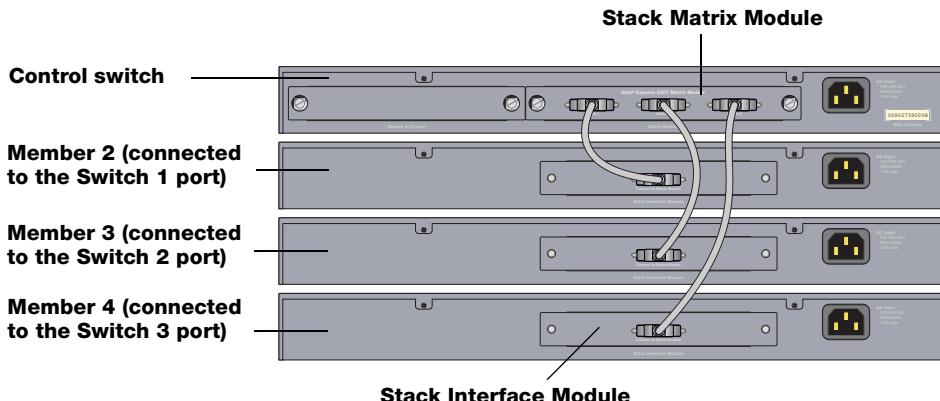
### About a stack

- There can be only one 530T switch in a stack.
- The 530T switch requires the installation of a Stack Matrix Module to stack it with a 535T. (Only one Stack Matrix Module is needed for the entire stack.)
- The 530T can be stacked only with 535T switches.
- You can stack up to three 535T switches with a 530T.
- In a stack, the 530T is the control switch and the 535Ts are the member switches.
- The member switches are all managed through the control switch's management interface.
- There is only one IP address for the entire stack of switches (the control switch's IP address).
- There can be only one instance of Spanning Tree, regardless of the number of switches in the stack.
- Ports from any switch can be members of any VLAN.
- For link aggregation, the anchor ports are 1, 7, 15 for both the control and member switches. You can also link aggregate the module ports on the control switch (530T).
- You can only link aggregate ports on the same switch.

## Assemble a stack

To stack a 530T with 535Ts, you need to purchase a Stack Matrix Module.

- 1 Insert the Stack Matrix Module into the slot in the back of the 530T, labeled Matrix Module, and tighten the screws.



- 2 Run a cable from the slot in the back of the 535T, labeled Stack Interface Module, to the control switch's Stack Matrix Module, where it reads "Switch 1." This connection makes this 535T switch Member 2 in the stack.
- 3 Repeat step 2 until you have added all member switches (535Ts) to the stack. You can add a total of three member switches.
- 4 Power on the control switch.

### NOTE

When setting up a stack, stack the 535T switches in the order in which they are connected to the Matrix Module.

The 535T connected to the Switch 1 port of the Matrix Module would be the switch directly under the control switch, the 535T connected to the Switch 2 port would be underneath that, etc.

This makes it easier to determine which switch is which when managing them.

## Which switch is which in a stack

In a stack of switches, the 530T is the control switch and the 535Ts are member switches.

The switch that you connect to the port labeled Switch 1 in the 530T's Stack Matrix Module is referred to in the Web Device Manager and Local Management as Member 2. The switch connected to the port labeled Switch 2, is Member 3. And the switch connected to the port labeled Switch 3, is Member 4.

# 2

# Using the Intel® Express 530T Switch

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## Overview

This section provides an overview for using the Intel® Express 530T Switch within a network. The chapter covers the basic differences between a switch and hub, basic switching features, such as flow control and Spanning Tree, and a discussion of the more advanced features such as link aggregation and the types of VLANs available on the switch.

If you are already familiar with switching technology you can skip ahead to a particular section within the chapter. Following is a basic overview of the chapter and the pages where you can find a particular topic.

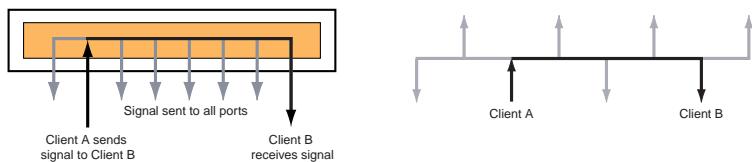
- **Sample Configurations** page 13
- **Flow Control** page 14
- **Spanning Tree Protocol** page 14
- **Tagged Frames** page 15
- **Priority** page 15
- **Link Aggregation** page 16
- **VLANs** page 17
- **GVRP** page 20
- **Internet Group Multicast Protocol** page 20

## What is a Switch?

A switch segments traffic, providing each port its own collision domain. This is different than a hub where all ports belong to the same collision domain.

### Segments and hubs

Hubs combine multiple wires so all attached devices behave as though they are on the same wire. Since the devices share the same segment, data sent by one device is retransmitted to all devices on the same hub. This is equivalent to having all devices connected in a bus topology as illustrated below.

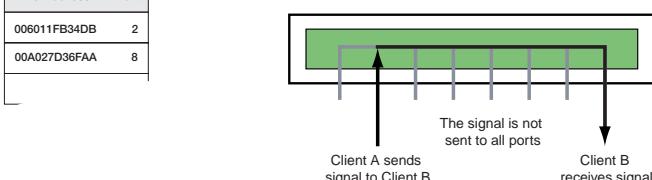


The disadvantage is all devices must share the total available bandwidth. The more devices that are attached to the hub results in less bandwidth for each user. Also, network performance suffers since all devices receive traffic and collisions from other users because the hub retransmits data across all ports.

### Switches

Switches send traffic only to specific ports, rather than transmit data across all ports. This means that each device attached to the switch receives fewer collisions and the entire bandwidth is available to the device.

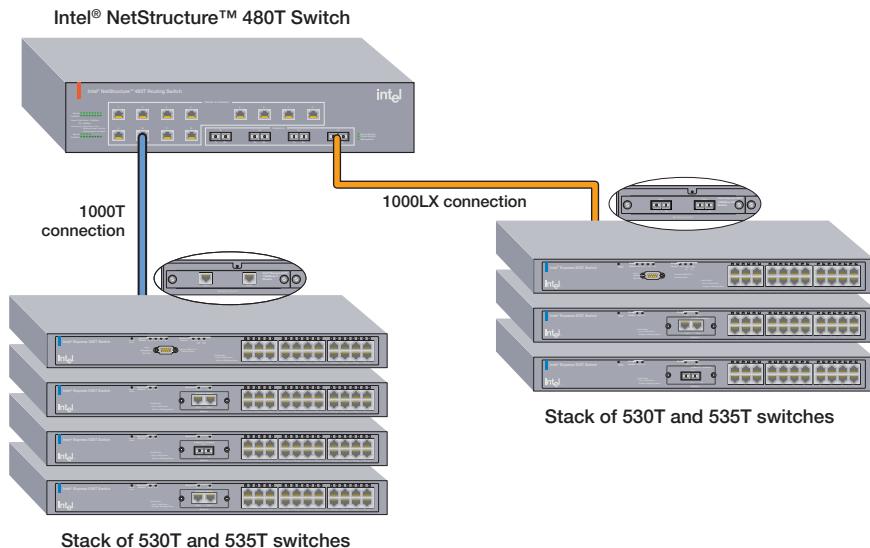
MAC Address	Port
00E011FB34DB	2
00A027D36FAA	8



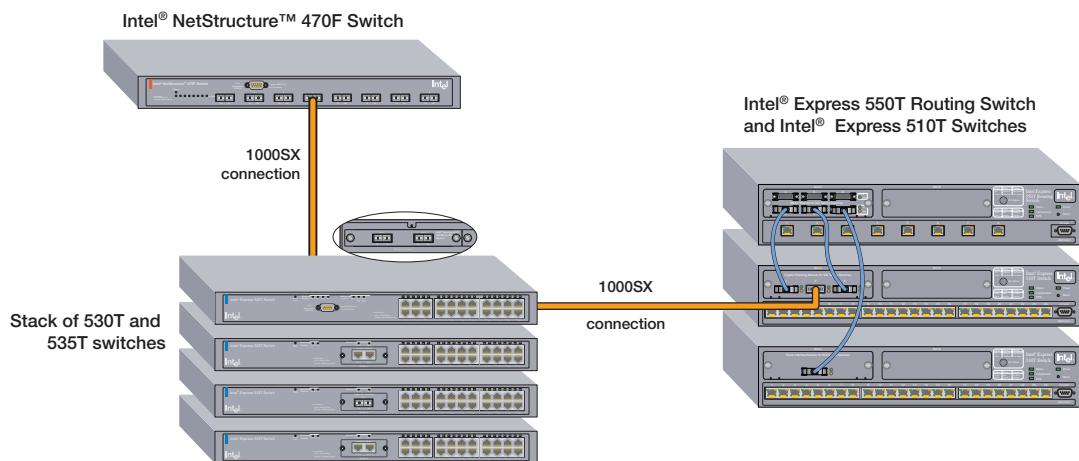
The switch maintains a table that associates a device's MAC address to a port on the switch. When Client A communicates with Client B, the switch looks in the table to determine which port Client B is attached to and then forwards the traffic to that port. If a device sends traffic to an address that is not in the table (or sends broadcast or multicast traffic) the switch sends the traffic out to all ports on the switch. When the switch receives a response it updates the table with the new address.

## Sample Configurations

The following examples illustrate how the 530T switch can be used in a network.



The example below shows how a stack of 530/535 switches connects with a stack of 550/510 switches (they cannot be in the same stack). This example also demonstrates the 530T's gigabit uplink by connecting it to a 470F switch.



## Flow Control

During times of heavy network activity, the switch's port buffers can receive too much traffic and fill up faster than the switch can send the information. In cases like this, the switch tells the transmitting device to wait so the information in the buffer can be sent. This traffic control mechanism is called flow control.

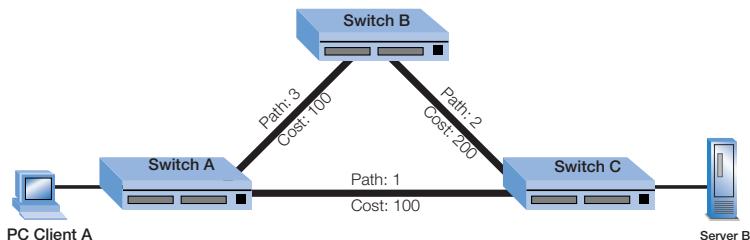
The method of flow control depends on whether the port is set to full- or half-duplex. If a port is operating at half-duplex, the switch sends a collision (also called backpressure) which causes the transmitting device to wait. If the port operates at full-duplex, the switch sends out an IEEE 802.3x PAUSE frame. You can enable or disable flow control for each port on the Express 530T switch.

## Spanning Tree Protocol

Spanning Tree helps to prevent any loops within the network topology. A loop can occur if there is more than one path for information to travel between devices. The Spanning Tree Protocol works by determining the “cost” of a connection. For example, if two devices are connected by two links, Spanning Tree uses the connection with the lowest cost and blocks the second connection from working.

Spanning Tree prevents loops by allowing only one active path between any two network devices at a time. However, you can also use this behavior to establish redundant links between devices which can take over in the event the primary link fails.

The 530T supports one instance of Spanning Tree per switch (or per stack of switches).



In this example, Client A can communicate with Server B over two different paths. The primary path is Path 1 because the cost of the connection between switches A and C is lower than the cost between switches A, B and C. If the primary path fails, traffic is sent over the backup path automatically.

## Tagged Frames

The 802.1D (1998 Edition) and 802.1Q specifications published by the IEEE (Institute of Electrical and Electronic Engineers) extends Ethernet functionality to add tag information to Ethernet frames and propagate these tagged frames between bridges (for example, a switch). The tag can carry priority information, VLAN information, or both and allows bridges to intelligently direct traffic across the network.

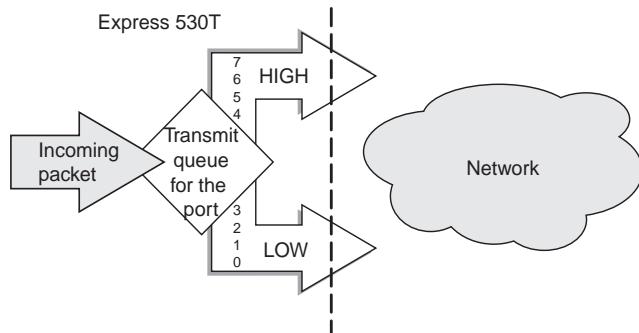
For outgoing (egress) packets you can specify whether you want the packets to be tagged or untagged. For incoming (ingress) packets you can set the ingress filtering so that packets are forwarded to a specific port as long as that port is a member of the VLAN. You can set a Port VLAN Identifier (PVID) so that if untagged traffic goes to that port, the packet inherits the VLAN Identifier (VID) of the port.

## Priority

The IEEE 802.1D (1998 Edition) specification incorporates IEEE 802.1p and defines information in the frame tag to indicate a priority level. When these tagged packets are sent out on the network, the higher priority packets are transferred first. Priority packet tagging (also known as Traffic Class Expediting) is usually set on the LAN adapter in a PC and works with other elements of the network (switches, routers) to deliver priority packets first. The priority level can range from 0 (low) to 7 (high).

The 530T switch can read the priority tags and forward traffic on a per-port basis. The switch uses two priority queues per port and routes traffic to a queue depending on the packet's tag. For example, when a packet comes into the switch with a high priority tag, the switch routes the packet to its high-priority queue.

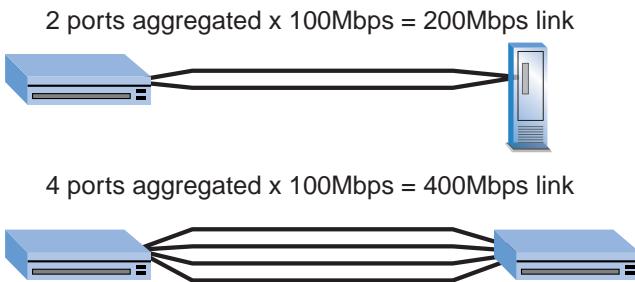
Even though there are eight priority levels, the 530T switch can route a packet into only one of the two queues. The switch maps levels 0-3 to the low queue (the default) and levels 4-7 to the high queue. If a packet is untagged, the switch determines the best way to send the packet.



## Link Aggregation

Link aggregation allows you to combine from 2 to 8 (adjacent) ports so that they function as a single high-speed link. For example, link aggregation is useful when making connections between switches or to connect servers to the switch.

Link aggregation, sometimes known as port trunking, can be used to increase the bandwidth to some devices. Link aggregation can also provide a redundant link for fault tolerance. If one link in the aggregation fails, the switch balances the traffic among the remaining links.



To aggregate ports, you must link an “anchor” port with an adjacent port. The 530T switch supports up to four link aggregation groups (anchor ports 1, 7, 15). This includes one link aggregation group for the two module ports.

### Guidelines

- The switch treats aggregated links as a single port. This includes Spanning Tree and VLANs.
- All ports share the same settings as the anchor port. You can change anchor port settings, but you cannot configure other ports in the link.
- When a port is configured as a member of an aggregated link, it immediately adopts the characteristics of the anchor port. When a port is no longer a member of an aggregated link, the characteristics are reset to the default settings (autonegotiate speed/duplex, flow control enabled).
- If a port is part of an aggregated link, it cannot be configured as the target port for a port mirror. However, a port in an aggregated link can serve as the source port for a port mirror.
- When a 530T is stacked with one or more 535T switches, you cannot aggregate ports that belong to separate switches. The 530T supports up to four link aggregation groups, and each 535T supports up to three.

## Virtual LANs

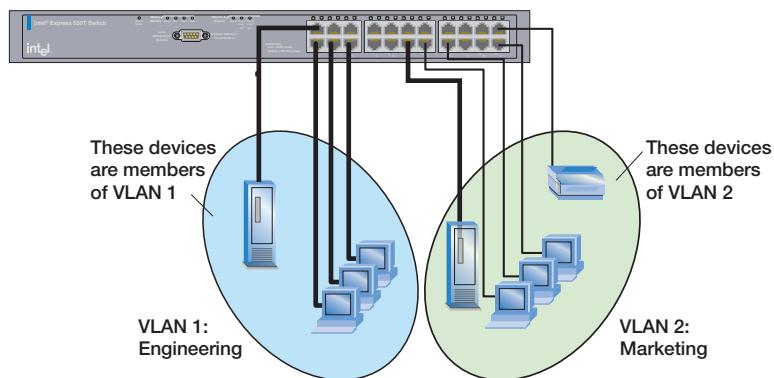
A Virtual LAN is a logical network grouping that allows you to isolate network traffic so members of the VLAN receive traffic only from other members. Creating a VLAN is the physical equivalent of moving a group of devices to a separate switch (creating a Layer 2 broadcast domain). The advantage of VLANs is that you can reduce broadcast traffic for the entire switch and increase security, without changing the wiring of your network.

The Express 530T switch supports two types of VLANs:

- Port-based
- IEEE 802.1Q (tag) -based

### Port-based VLANs

This is the simplest and most common form of VLAN. In a port-based VLAN, the system administrator assigns the switch's ports to a specific VLAN. For example, the system administrator can designate ports 2, 4, 6, and 9 as part of the engineering VLAN and ports 17, 19, 21, and 22 as part of the marketing VLAN. The advantage of port-based VLANs is that they are easy to configure and all changes happen at the switch so they are transparent to the users. The 530T supports a maximum of 24 port-based VLANs. A port can belong to only one VLAN at a time.



If a user changes location, the system administrator reassigns the port to the new VLAN. Another advantage is if a hub is connected to a port that is part of a VLAN, all devices connected to the hub are also part of the VLAN. The disadvantage is that there is no way to exclude an individual device on that hub from becoming part of the VLAN.

When a 530T switch is stacked with one or more 535T switches, ports from any of the switches can be members of a port-based VLAN.

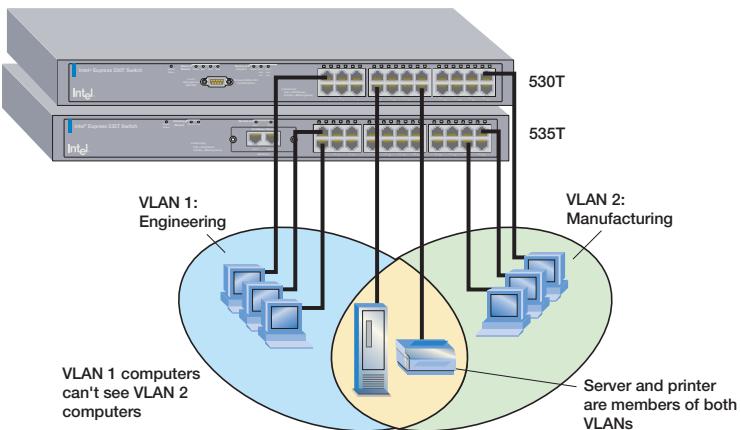
## IEEE 802.1Q (tag-based VLANs)

The second type of VLAN supported by the 530T switch is based on the IEEE 802.1Q specification. The specification provides a uniform way for creating VLANs within a network and allows the creation of a VLAN that can also span across the network. Until recently, VLAN implementation was vendor specific so it was not possible to create a VLAN across devices from different vendors.

### NOTE

When a 530T is stacked with one or more 535T switches, ports from any/all of the switches can be members of each VLAN.

The 802.1Q VLAN works by using a tag added to the Ethernet frames. The tag contains a VLAN Identifier (VID) that identifies the frame as belonging to a specific VLAN. These tags allow switches that support the 802.1Q specification to segregate traffic between devices and communicate a device's VLAN association across switches.



There are multiple advantages to implementing 802.1Q VLANs. First, it helps to contain broadcast and multicast traffic across the switch thus improving performance. Second, ports can belong to more than one VLAN. Third, VLANs can span multiple switches that support the 802.1Q specification. Finally, it can provide security and improve performance by logically isolating users and grouping them together. The 530T switch supports up to 2047 tag-based VLANs.

A logical grouping can be mapped to a work group. For example, you can create a VLAN that groups all the users from the engineering department into one VLAN. A benefit of this logical grouping is that it can improve performance by cutting down traffic that belongs to a different logical group (for example, marketing), improve security (engineering can't see marketing), and ease moves since the user doesn't have to be physically located in the same group to participate in the VLAN.

When a 530T switch is stacked with one or more 535T switches, ports from any/all of the switches can be members of a tag-based VLAN.

On the 530T switch, overlapping VLANs can be supported through the use of 802.1Q-capable devices. However, for non-802.1Q-capable devices, overlapping VLANs can be supported by implementing an asymmetric VLAN on the switch (see references below for more information). An asymmetric VLAN is a type of 802.1Q configuration where endstations send traffic on one VLAN and receive traffic on another VLAN. The 530T switch can support asymmetric VLANs.

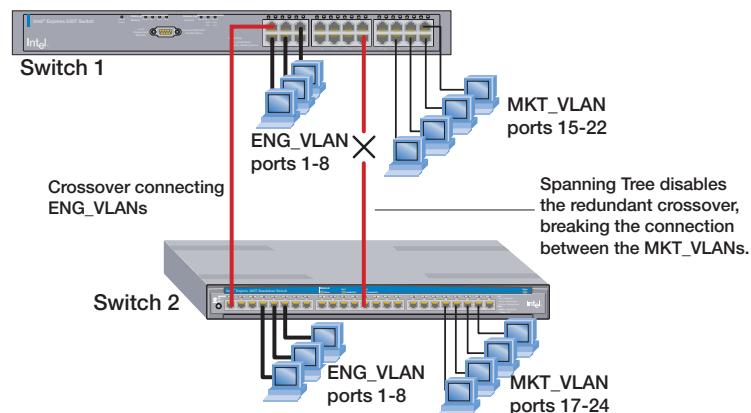
To learn more about asymmetric VLANs, see <http://support.intel.com/support> or refer to IEEE 802.1Q Specification Annex B.1.3.

## Spanning Tree and VLANs

The 530T supports the Spanning Tree Protocol across the entire switch (or stack of switches), not per VLAN. If a loop occurs in a VLAN the port is disabled and all VLAN traffic over that port is blocked.

A good example of this can be seen below. Both Switch 1 and Switch 2 have two port-based VLANs configured. Crossover cables connect the ENG\_VLAN on Switch 1 to ENG\_VLAN on Switch 2. Crossover cables also connect the MRKT\_VLAN on Switch 1 to the MRKT\_VLAN on Switch 2. When Spanning Tree is enabled, the redundant link between the MRKT\_VLANs is blocked and those VLANs can no longer communicate.

When the switch is running 802.1Q VLANs, Spanning Tree is required for GARP VLAN Registration Protocol (GVRP) to work properly.



## GARP VLAN Registration Protocol (GVRP)

Since IEEE 802.1Q VLANs can span networks, it poses a challenge for network administrators to manage changes to the VLAN. The GARP (Generic Attribute Registration Protocol) VLAN Registration Protocol (GVRP) provides a dynamic mechanism for switches to share topology information and manage changes with other switches. This alleviates the network administrator from manually propagating VLAN configuration information across switches.

GARP is defined by the IEEE 802.1D (1998 Edition) specification and is the mechanism used by switches and end nodes to propagate VLAN configurations across the network domain. GVRP uses GARP as a foundation to propagate VLAN configurations to other switches.

Devices that support GVRP transmit their updates to a known multicast address that all GVRP-capable devices monitor for information updates.

Sending GVRP messages between switches accomplishes these tasks:

- Dynamically adds or removes a port from participating in a VLAN
- Sends updates about the switch's own VLAN configuration to neighboring GVRP-capable devices
- Integrates dynamic and static VLAN configurations within the same switch. Static VLAN configurations are created by the user on the switch for devices that don't support GVRP

Dynamically created VLANs are not saved in the switch's memory. When the device that is sending out the GVRP updates is disabled or rebooted the dynamic VLAN is removed.

### NOTE

The 530T supports a maximum of 24 IGMP sessions, with a maximum of 32 multicast groups per session. These parameters are the same whether the 530T is standalone or in a stack.

## Internet Group Multicast Protocol

Under normal circumstances, multicast traffic is broadcast by the switch to all ports. For multicast traffic based on the IGMP (Internet Group Multicast Protocol), the switch can optimize the broadcasting of multicast traffic by forwarding multicast traffic to only the ports that require it.

IGMP snooping is a feature that allows the switch to forward multicast traffic intelligently. The switch “snoops” the IGMP query and report messages and forwards traffic to only the ports that request the multicast traffic. This prevents the switch from broadcasting the traffic to all ports and possibly affecting network performance.

IGMP requires a router that records the presence of multicast groups on its subnets and keeps track of group membership. It is important to remember that multicasting is not connection oriented, so data is delivered to the requesting hosts on a best-effort level of service.

# 3

# Using Intel® Device View 2.1

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## Overview

Intel Device View allows you to manage the Intel® Express 530T Switch and other supported Intel networking devices on your network.

Intel Device View provides these features:

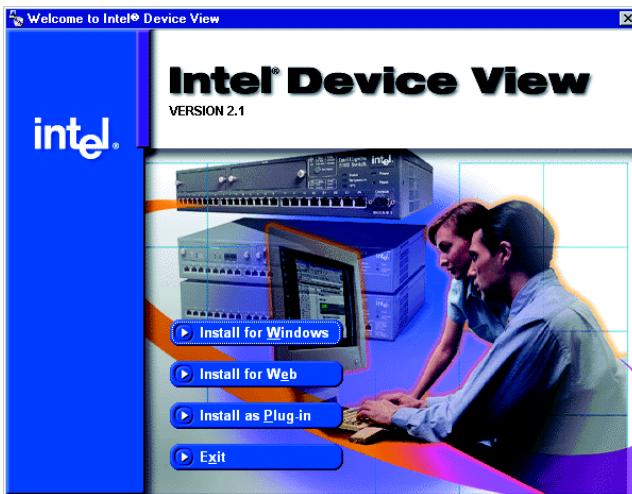
- The ability to configure new network devices
- Graphical device manager for Intel switches, hubs, and routers
- Autodiscovery, which finds supported Intel devices on the network
- The Device Tree, which shows all the supported devices detected on your network
- Remote Network Monitoring (RMON)
- Web or Windows\* platform
- Plug-in to HP OpenView®, IBM Tivoli NetView®, and Intel LANDesk® Network Manager
- Other useful tools such as a TFTP server

## Installing Intel Device View

Before you install Intel Device View, make sure your PC meets the system requirements in the *Intel Device View User Guide*, which is included on the Intel Device View CD-ROM.

### To install Intel Device View

- 1 Insert the Intel Device View CD-ROM in your computer's CD-ROM drive. The Intel Device View installation screen appears. If it doesn't appear, run `autoplay.exe` from the CD-ROM.



- 2 Choose the version of Intel Device View you want to install.
  - Click **Install for Windows** to install Intel Device View for use on this PC only.
  - Click **Install for Web** to install Intel Device View on a Web server. You will be able to access the Device View server from any PC on your network with Internet Explorer® 4.0x or later.
  - Click **Install as Plug-in** to install Intel network device support for HP OpenView, IBM Tivoli NetView, or Intel LANDesk Network Manager. This option is not available if you don't have OpenView, Net View, or LANDesk Network Manager installed on the PC.
- 3 Follow the on-screen instructions in the installation program.

## Starting Intel Device View

Install either the Windows or Web version of Intel Device View.

### Windows version

From your desktop, click Start and then point to Programs > Intel Device View > Intel Device View - Windows. Intel Device View's main screen appears.

### Web version

- From your desktop, click Start and then point to Programs > Intel Device View > Intel Device View - Web. Intel Device View's main screen appears.
- To view Intel Device View from another PC on your network, type the following URL. In the example shown below, the URL is entered into the Address field for Internet Explorer.

***http://servername/devview/main.htm***

where ***servername*** is the IP address or name of the server where Intel Device View is installed.

Intel Device View's main screen appears.

#### NOTE

These are the requirements if you want to use the Web version of Device View:

##### Web browser

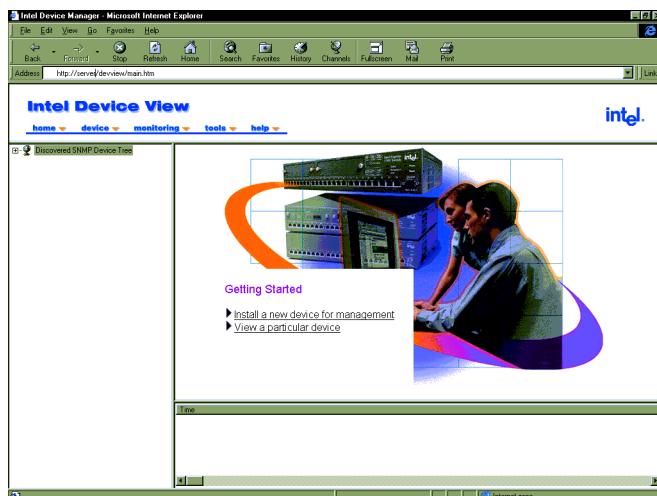
Internet Explorer 4.0 or newer

##### Web server

Internet Information Server (IIS) 2.0 or newer

Peer Web Services\*

Netscape Enterprise\* Web server 3.01 or later.



## Installing a New Device

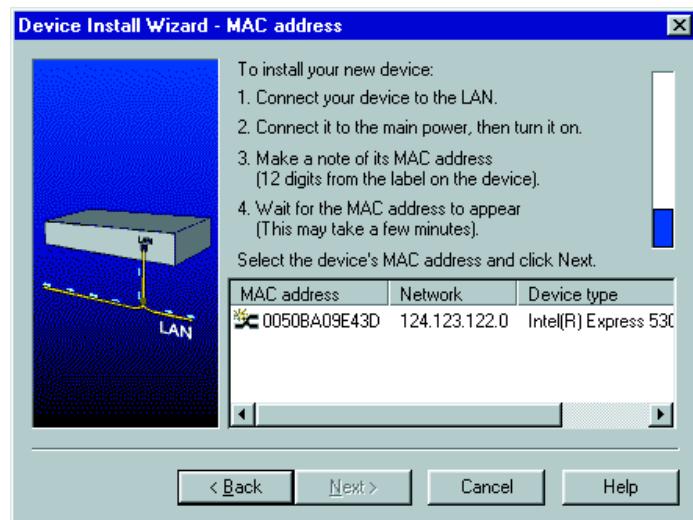
After you've installed a new switch on your network, you can use Intel Device View's Device Install Wizard to configure it for management.

### To install and configure a new switch for management

#### NOTE

The 530T sends BootP requests for several minutes; after that time, if no IP has been entered, the switch stops sending the request and continues to boot.

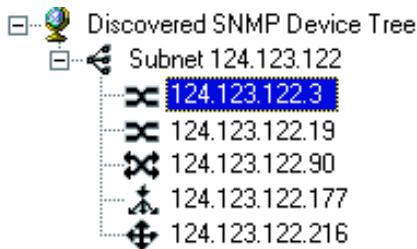
In a stack of switches, only one MAC address (the control switch's MAC address) is discovered.



- 4 Follow the instructions in the wizard to assign an IP address and a name to the switch (or stack of switches).

## Using the Device Tree

When you start Intel Device View, the Device Discovery service begins searching for supported Intel network devices on your network. As it discovers devices, the Device Discovery service adds an icon for each device to the Device Tree on the left side of the screen.



Different states of the 530T switch are represented by unique icons in the Device Tree.

### Device Tree icons

- Device Tree root
- Subnet
- Intel Express Switch (if non-responding the icon is red)
- Unconfigured Intel Express Switch
- Group of Intel Express Switches
- Intel Express Router
- Intel Express Switch (Layer 3 capable)
- Intel Express Stackable Hub

The Device Tree works much like Windows Explorer. To expand the root or a subnet, click the (+) next to the icon. To collapse the view, click the (-) next to the icon. Double-click a device icon to view the device image.

## To add a device to the Device Tree

Use this procedure if the device does not automatically appear after installation.

- 1 Right-click anywhere on the Device Tree.
- 2 On the menu that appears click Add Device.
- 3 In the Add Device dialog box, type the IP address of the switch you want to add.
- 4 Fill in the other fields, as appropriate.
- 5 Click OK.

The new switch's icon appears in the Device Tree.

## To refresh the Device Tree

- 1 Right-click anywhere on the Device Tree.
- 2 On the menu that appears click Refresh.

Refreshing the Device Tree updates it to show any newly discovered devices and changes in device status.

## To delete a device from the Device Tree

- 1 Right-click the device you want to remove from the Device Tree.
- 2 On the menu that appears click Delete.

Deleting a device from the Device Tree does not affect the actual device.

## To find a device in the Device Tree

- 1 Right-click anywhere on the Device Tree.
- 2 On the menu that appears click Find.
- 3 In the Find Device dialog box, type the IP address of the device you want to find in the tree.
- 4 Click OK.

The device's icon is highlighted in the Device Tree.

## Losing contact with a device

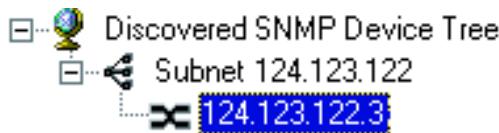
If Intel Device View loses contact with a switch, it replaces the switch icon with the non-responding switch icon, which is red.



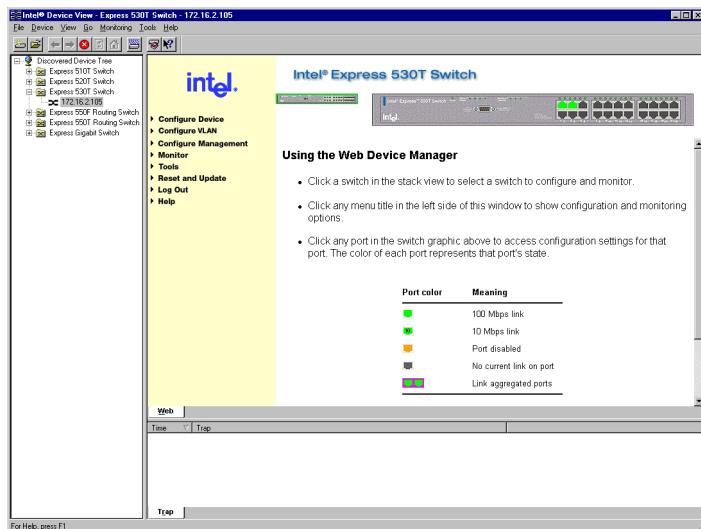
If the non-responding switch icon appears, you will not be able to manage the device in Intel Device View. If you're unable to ping the device or start a Telnet session, try accessing the switch's Local Management.

## Managing a Switch

To manage the 530T switch, double-click the switch icon in the Device Tree. In the example shown below, the switch has been assigned an IP address of 124.123.122.3.



The 530T Web Device Manager appears in the Intel Device View window. For information on using the Web Device Manager, see Chapter 4.



For more information on using Intel Device View, refer to the program's online help or see the User Guide on the Intel Device View installation CD-ROM.

## Viewing RMON Information

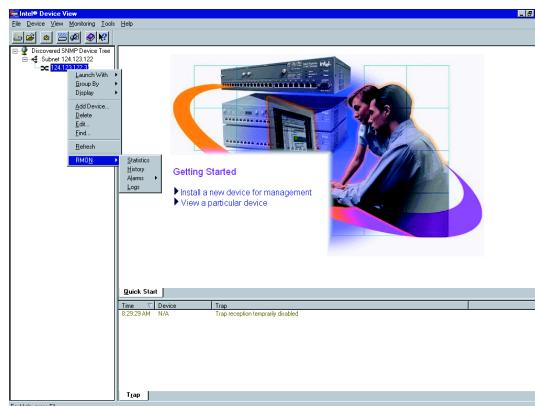
The remote monitoring (RMON) specification extends Simple Network Management Protocol (SNMP) functionality to look at traffic patterns on the network instead of merely looking at the traffic for an individual device. The following RMON groups are supported:

- **Group 1 (Statistics):** Monitors utilization and error statistics for each network segment (10Mbps or 100Mbps).
- **Group 2 (History):** Records periodic statistical samples from variables available in the statistics group.
- **Group 3 (Alarms):** Allows you to set a sampling interval and alarm thresholds for statistics. When a threshold is passed, the switch creates an event. For example, you might set an alarm if switch utilization exceeds 30%.
- **Group 9 (Events):** Provides notification and tells the switch what to do when an event occurs on the network. Events can send a trap to a receiving station or place an entry in the log table, or both. For example, when the switch experiences an RMON Event, it sends out an Alarm.

The switch also keeps a log that shows a list of the RMON Events and RMON Alarms that have occurred on the switch.

### To view RMON statistics

- 1 Right-click the switch's icon in the Device Tree, then point to RMON.
- 2 Click the RMON option you want to view:



You can also access RMON features by using LANDesk Network Manager, or an SNMP application that supports RMON such as OpenView. For more information about using RMON to monitor the switch, refer to the Intel Device View Help.

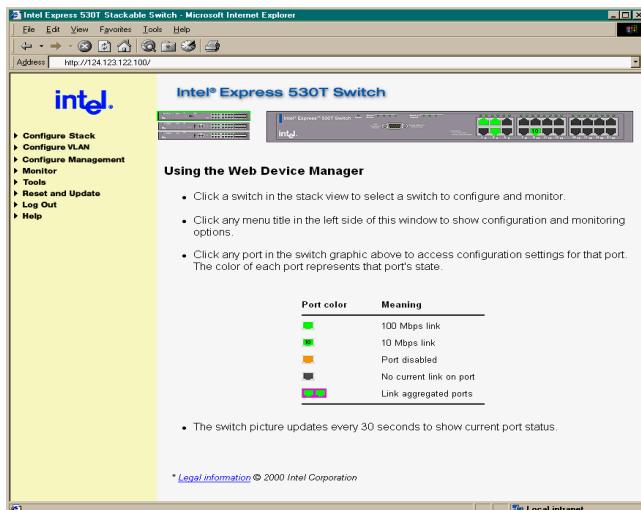
# 4

# Using the Web Device Manager

## Overview

The Web Device Manager, built into the Intel® Express 530T Switch, lets you use a Web browser to manage and monitor the switch. For example, you can use the Web Device Manager to configure the switch or individual ports, or to monitor traffic statistics and utilization.

This chapter covers the major management functions of the 530T. For additional information about using this interface, see the Web Device Manager Help.

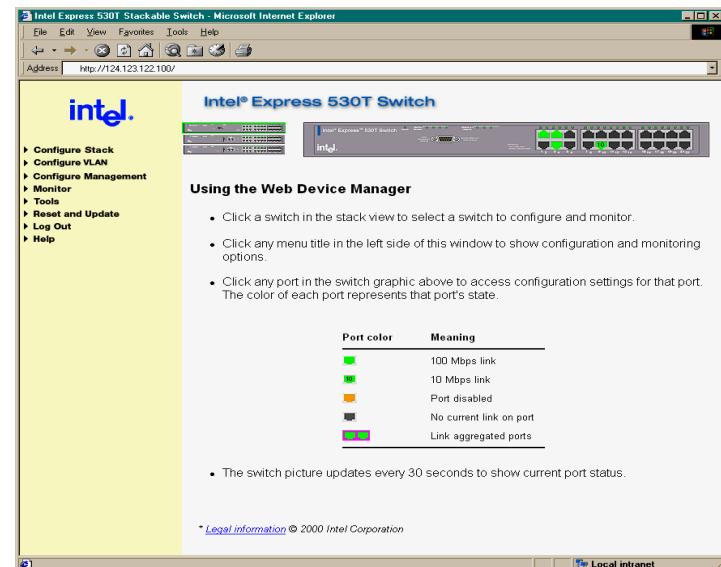


## Accessing the Web Device Manager

### NOTE

The default IP address assigned to the switch is 192.0.2.1. To access the switch with the default IP address, your workstation must be on the 192.0.2.0 subnet.

Alternatively, you can connect to the switch using Local Management and set an IP address that is on your network. Then you can access the Web Device Manager using the new IP address.



# Navigating the Web Device Manager

## Navigate between switches

On the switch stack graphic at the top of the page, click the switch you want to configure. The “active” switch is highlighted in green.

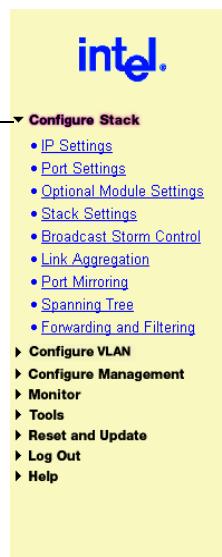
**Click a switch in the stack to view or configure its settings.**



## Navigate between menus

- 1 On the left side of the Web Device Manager window, click a menu item (such as Configure Stack) to show the available options.
- 2 Click an option in the menu. The corresponding screen appears on the right side of your Web browser window.
- 3 To hide the options, click the menu item again.

**Click a menu to view available options.**



## Using Management Screens

After you select an option from the navigation menu, the corresponding screen appears in the right side of the Web browser.

### Switch faceplate graphic



A graphical representation of the switch's faceplate appears at the top of the screen.

If the option you're working with allows you to configure or monitor a specific port, you can change to another port by clicking it on the faceplate graphic.

Port color on the faceplate graphic indicates the status of the port.

Port Color	Meaning
Green	Port has a link at 100Mbps.
Green with "10"	Port has a link at 10Mbps.
Magenta outline	Ports are in a link aggregation.
Orange	Port is disabled.
Gray	No link.

### Buttons

Configuration screens include four buttons on the bottom of each screen.

#### Button Function

Submit	Applies the configuration settings on the current screen. <b>Note:</b> If you do not save the settings to the switch's memory your changes will be lost when the switch is rebooted.
Reset	Clears any changes you made on the current screen and restores the currently applied settings.
Default	Applies factory defaults for this screen's settings. When you log out, you can permanently save the new settings to the switch. Otherwise, they are lost upon the next reboot.
Help	Displays help for the current screen.

## Configuring the Switch's IP Settings

Note: You must select Manual in the IP Assignment Method box before you can change the IP settings.

- 1 Click the Configure Stack menu and then click IP Settings. The IP Settings screen appears on the right side of the Web Device Manager window.

### IP Settings

Enter the settings then click **Submit**. The new settings will take effect after the next switch reboot.

*You can configure the IP settings only when the IP assignment method is Manual.*

**MAC Address:**00-90-27-39-8D-AB

	Current Settings	New Settings
<b>Assign IP:</b>	Manual	<input type="button" value="Manual"/>
<b>IP Address</b>	134.134.155.222	<input type="text" value="134.134.155.222"/>
<b>Subnet Mask</b>	255.255.255.0	<input type="text" value="255.255.255.0"/>
<b>Default Gateway</b>	134.134.155.251	<input type="text" value="134.134.155.251"/>

### NOTE

Each stack of switches has one IP address.

- 2 To manually configure the IP settings, select Manual in the IP Assignment Method box. In the Change box, type the new IP address, subnet mask, and default gateway. If you have set up tag-based VLANs on the switch, you can specify the VID (VLAN ID) of the VLAN where the switch's SNMP management agent will reside.
- 3 To apply the changes, click Submit.
- 4 Click Save and Reboot for the new settings to take effect. Rebooting the switch temporarily interrupts network connectivity to the switch. Click Reboot Later if you want to reboot the switch later. The new IP settings do not take effect until the switch reboots.

## Configuring a Port

You can use the Web Device Manager to enable or disable a port, and to change its speed, duplex, flow control, and priority settings.

### To change port settings

- 1 Click the Configure Stack menu and then click Port Settings. To access the Port Settings screen for each port, click the port you want to configure on the faceplate graphic.

**Control Switch - Port 1 Settings**

[Configure All Ports and Module in a Switch](#)      [View All Ports and Module in a Switch](#)

To configure a port in a different switch, use the stack view to select a switch. Enter the settings, then click Submit to apply the changes on this page. The flow control setting will take effect after the next switch reboot.

**Link Status:** 100Mbps/Full/FC-Off

Port State	Enabled <input type="button" value="▼"/>
Speed/Duplex	Auto-Negotiate <input type="button" value="▼"/>
Flow Control	Auto <input type="button" value="▼"/>
Priority Queue	Default (Use Frame Priority Tag) <input type="button" value="▼"/>

Note: This is the anchor port for a link aggregation. Any changes you make to this port's configuration will also affect any ports linked to it.

#### NOTE

If you change the flow control or IP settings, you must reboot the switch before the new settings can take effect.

- 2 Click the options you want to change.

- **Port State:** Enable or disable the port.
- **Speed/Duplex:** Set port speed to Auto-Negotiate, 10Mbps, or 100Mbps.
- **Flow Control:** Enable or disable flow control.
- **Priority Queue:** Set the priority queue for packets sent or received on this port.

- 3 Click Submit.

## Managing User Accounts

Create user accounts to give specific users read or write access to the switch through the Web Device Manager and Local Management. You can create a maximum of three accounts on the switch.

### NOTE

The accounts and passwords you create with the Web Device Manager are the same accounts and passwords used to access Local Management.

### To create a user account

- Click the Configure Management menu and then click User Accounts. The first account you create must be an administrator.

User Name	Access
cyu	administrator
byoshi	user (view data only)
acalkins	user (view data only)

Add    Modify    Delete    Help

- Click Add.

### Add User

User Name :

Password:

Confirm Password:

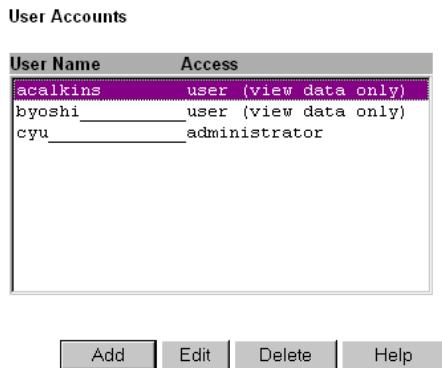
Access Level  Administrator

Submit    Reset    Help

- Type a user name in the User Name box. The username can be up to fifteen characters long and is case-sensitive.
- The password can be up to fifteen characters long and is case-sensitive. Asterisks (\*) appear on the screen as you type the password.
- In the Confirm Password box, type the same password.
- In the Access Level box click an access level. An administrator can view all settings and make configuration changes. A user can only view settings.
- Click Submit.

## To delete a user account

- 1 Click the Configure Management menu and then click User Accounts.
- 2 In the User Accounts screen, click the account you want to delete.



- 3 Click Delete.

If you delete the account you used to log in for this session, you can still use that account until you log out. If you delete the only user account on the switch, you can log in again using the default of no user name and no password.

## Configuring VLANs

Virtual LANs, or VLANs, provide a way to create a logical network grouping without regard to physical location of the network nodes.

For more information about VLANs, refer to “Virtual LANs” in Chapter 2.

There are two main steps to set up a VLAN with the Web Device Manager:

- Set the switch’s VLAN operation mode.
- Configure the type of VLAN you selected.

### NOTE

You can have only one operation mode (either port- or tag-based) active on the switch at a time.

### To set the switch’s VLAN operation mode

- 1 Click the Configure VLAN menu and then click VLAN Operation Mode.
- 2 From the Current VLAN mode box, click the type of VLAN to set up.

#### VLAN Operation Mode

Select a VLAN mode, then click **Submit** to save changes and reboot the switch.

Current VLAN mode is:

You can set the 530T switch to use port-based or tag-based VLANs. See “Virtual LANs” in Chapter 2 for more information about VLAN types.

- 3 Click Submit.
- 4 The switch will automatically reboot. The 530T must be rebooted whenever you change its VLAN operation mode.

After the switch restarts, you can configure the type of VLAN that you selected.

## Port-based VLAN

You configure a port-based VLAN by first creating the VLAN and then adding participating ports. The switch can support up to 24 port-based VLANs. A port can be a member of only one VLAN; port-based VLANs cannot overlap.

### To configure a port-based VLAN

- 1** Click the Configure VLAN menu and then click Port-based VLAN.
- 2** Click Add to create a new VLAN, or select a VLAN and click Edit to change its configuration.

#### Port-based VLAN Membership

To add a port to this VLAN, select it in the Available ports column and click Add. Ports that belong to another VLAN cannot be added.

After you have configured the VLAN settings, click **Submit** to apply the changes on this page.

VLAN Name:

Switch Unit:

Available ports	Member ports
1	Control Switch, Port 5
2	Member Switch 2, Port 10
3	Member Switch 3, Port 20
4	
5	
6	
7	
8	
9	
10	
11	
12	

Enable IGMP Snooping for this VLAN

- 3** If you are creating a new VLAN, type a name in the VLAN Name box.
- 4** In the Switch Unit box, select a switch whose ports you want to add to the VLAN. You can include ports from any/all switches in a port-based VLAN.
- 5** In the Available ports box, select a port to add to the VLAN and click Add. Continue adding ports from each switch as necessary.
- 6** When you have finished adding ports, click Submit.

## Tag-based VLAN

You configure a tag-based VLAN by configuring port membership and ingress/egress rules. It is important to note whether the devices in your VLAN support 802.1Q VLAN tags. If some of your devices don't support tagging, additional configuration may be necessary.

### To configure a tag-based (IEEE 802.1Q) VLAN

- 1 Create a VLAN and assign member ports.

- Click the Configure VLAN menu and then click Tag-based (IEEE 802.1Q) VLAN.
- From the main Tag-based VLAN page, click Add to create a new VLAN. To modify an existing VLAN, click the VLAN name and click Edit.
- If you are creating a new VLAN, type a name and VID (from 2 to 4094) to identify it.

Add Tag-Based (IEEE 802.1Q) VLAN

[Basic](#) [Port Settings](#) [Port VID](#)

Assign a name and ID number to the new VLAN.

VLAN Name:  VID:

Switch Unit :

Add tagged ports to the VLAN and click Submit to apply the changes on this pages.

Available ports	Member ports
1 2 3 4 5 6 7 8 9 10 11 12	<input type="button" value="Add &gt;"/> <input type="button" value="&lt; Remove"/>

Enable IGMP Snooping for this VLAN

[Next >](#) [Reset](#) [Help](#)

- In the Switch Unit box, select a switch whose ports you want to include in the VLAN. You can include ports from any/all switches in a tag-based VLAN.
- To add a port to the VLAN, click the port in the Available ports box and click Add. To remove a port, click the port in the Member ports box and click Remove.
- The switch supports a maximum of 24 IGMP (Internet Group Multicast Protocol) Snooping sessions to manage broadcast traffic. If you want the VLAN to be part of an IGMP Snooping session, select the Enable IGMP Snooping check box.
- When you have finished adding ports, click Next.

## 2 Configure ports for egress (outbound) tagging.

- Ensure that the VLAN Name field displays the name of the VLAN you are configuring.
- Select Tag or Untag for each of the VLAN's ports, to determine whether the switch removes (untags) tags before sending traffic out of each port.

### NOTE

Select "Tag" when devices connected to the port support 802.1Q VLANs. Select "Untag" when devices connected to the port do not support 802.1Q VLANs.

If the VLAN members are from more than one switch, scroll down the screen to configure tagging for those ports.

- Click Submit.

### Tag-based (IEEE 802.1Q) VLAN - Egress Port Tagging

[Basic](#) [Port Settings](#) [Port VID](#)

Enter the settings, then click Submit to apply the changes on this page.

VLAN Name:  VLAN ID:50

#### Control Switch:

Port	Settings	Port	Settings	Port	Settings
1	Untag	9	N/A	17	N/A
2	Tag	10	N/A	18	N/A
3	N/A	11	N/A	19	N/A
4	N/A	12	N/A	20	N/A
5	N/A	13	N/A	21	N/A
6	N/A	14	N/A	22	N/A
7	N/A	15	N/A		
8	N/A	16	N/A		

#### 1000Base-SX Module Port Settings

Port	Settings
1	N/A
2	N/A

**3** Configure ports for handling untagged traffic.

- From the main Tag-based VLAN page, click Port Settings.
- On the Port Settings screen, you can set port-specific behaviors for processing VLAN traffic. To configure a specific port, click it in the faceplate graphic. To configure the same setting across all ports, click Configure All Ports and Module.

[Basic](#) [Port Settings](#) [Port VID](#)

[Configure All Ports and Module](#) [View All Ports and Module](#)

NOTE: If you change the Default PVID for this port, check that the port belongs to that VLAN. If the port is connected to a device that cannot process 802.1Q tags, the PVID must be a VLAN that includes the port. Otherwise, the switch will not forward untagged traffic coming into that port.

Enter the settings for all ports, then click Submit to apply the changes on this page.

**All Ports**

<b>Default Port VID</b> (Default VID for packets without an assigned VID)	<input type="text" value="1"/>
<b>GVRP</b> (For on-demand VLAN join / leave)	<input checked="" type="checkbox"/> Disabled
<b>Ingress Filtering</b> (Forward only packets with VID matching this port's configured VID)	<input checked="" type="checkbox"/> Disabled

## Options include:

- Default Port VID:** (This option is only available when you click Configure All Ports and Module. Sets the port VID (PVID) that is assigned to untagged traffic on a given port. For example, if port 10's default PVID is 100, all untagged packets on port 10 belong to VLAN 100. The default setting for all ports is VID 1.)
- GVRP (GARP VLAN Registration Protocol):** Allows automatic VLAN configuration between the switch and nodes.
- Ingress filtering:** Allows incoming frames belonging to a specific VLAN to be forwarded if the port belongs to the same VLAN. Disabling this setting causes all frames to be forwarded, regardless of the port's VLAN membership.

Click Submit after you have changed the settings.

**NOTE**

When configuring link aggregation between two 530T switches, you must connect anchor port to anchor port, and member port to member port.

When a 530T is stacked with one or more 535T switches, you cannot aggregate ports that belong to different switches. The 530T supports up to four link aggregation groups (which includes the module ports), and each 535T in the stack supports up to three groups.

## Link Aggregation

Link aggregation lets you group up to eight consecutive ports into a single dedicated connection. This feature can expand bandwidth between devices on the network, such as another switch or a server.

The anchor port is the base port in a link aggregation; it is the only port with configurable settings in the aggregation. All member ports in an aggregation take on the settings of the anchor port, this includes settings relating to VLANs and Spanning Tree.

Only consecutive ports, starting from the anchor port, can be grouped in a link aggregation. For example, ports 1, 2, and 3 are a valid link aggregation; ports 2, 4, and 7 are not.

On the Web Device Manager's switch faceplate graphic, a link aggregation is shown with its ports outlined in magenta (pink).

### To create a link aggregation

- 1 Click the Configure Stack menu, then click Link Aggregation.

Note: Connectivity is momentarily interrupted when changes are applied.

Anchor Port	Port Width	Group Name	Status
Port 1	2		Disabled
Port 7	2		Disabled
Port 15	2		Disabled
Module Port 1	2		Disabled

Submit    Reset    Default    Help

- 2 Choose the switch for which you want to configure link aggregation.
- 3 Choose the anchor port. Anchor ports are listed by number in the left column.
- 4 From the Port Width box, click the total number of ports (including the anchor port) to include in the link aggregation.
- 5 Type a name for the aggregation group.
- 6 Click Enable to make the group active.
- 7 Click Submit.

**NOTE**

Connectivity is momentarily interrupted when you apply changes.

## Static MAC Addresses

The MAC address table stores all the MAC addresses that the switch records. The switch uses this table for forwarding traffic to specific devices, so it does not rely solely on broadcasting traffic to every port for communication.

There are two ways to add addresses to the MAC address table:

- 1 The switch can record addresses and add them dynamically. Dynamic entries remain in the table only while the associated node is active, and they are deleted if the node is inactive for longer than a specified period of time (age-out time; the default is 300 seconds).
- 2 You can manually add MAC addresses to the table. These are called static addresses because they remain in the table until you remove them, even if the associated node is inactive or taken off the network.

### To add a static MAC address to the address table

- 1 Click the Configure Stack menu, then click Forwarding and Filtering.
- 2 Click Static MAC Addresses.
- 3 Click Add.

Add Static MAC Address

MAC Address:	<input type="text"/>		
(Do not use dashes when entering MAC addresses.)			
VID:	<input type="text"/>		
Switch:	<input type="button" value="Control"/>	Port Number:	<input type="button" value="1"/>
<input type="button" value="Submit"/> <input type="button" value="Reset"/> <input type="button" value="Help"/>			

#### NOTE

To view the switch's address table, click the Monitor menu, click Advanced, then click MAC Address Table.

#### NOTE

If you want to associate a MAC address with multiple VLANs, you must use tag-based VLANs.

- 4 In the MAC Address box, type the MAC address of a device on the network. Do not include hyphens.
- 5 If port-based or tag-based (IEEE 802.1Q) VLANs are set up on the switch, static MAC addresses are associated with specific VLANs. Type the VLAN name (port-based VLANs) or VID (tag-based VLANs) to associate with the MAC address.
- 6 In the Switch box, select the switch to whose ports you want to apply the filter.
- 7 In the Port number box, click a port number.

For the LX and SX optional modules, the port number is MP1.

- 8 Click Add.

## Configuring Community Strings and Trap Receivers

A trap receiver is a computer on the network that is running an SNMP management application and receives messages sent by the switch. For example, the switch can send a trap to the trap receiver when it detects a change in port speed.

### NOTE

These traps are supported by the switch:

- Power to the switch was cycled or reset.
- Link, speed, or other status changes on a port.
- Spanning Tree topology changes.
- A port is partitioned.
- Authentication failure.

### To specify a trap receiver

- 1 Click the Configure Management menu and then click Community Strings and Traps.

#### Community Strings and Traps

Enter the settings, then click **Submit** to apply the changes on this page.

#### Community Strings

Read Community String	<input type="text"/>
Write Community String	<input type="text"/>

#### Trap Receiving Stations

IP Address	Status	Community String
<input type="text"/>	Enabled <input type="button" value="▼"/>	<input type="text"/>
<input type="text"/>	Enabled <input type="button" value="▼"/>	<input type="text"/>
<input type="text"/>	Enabled <input type="button" value="▼"/>	<input type="text"/>
<input type="text"/>	Enabled <input type="button" value="▼"/>	<input type="text"/>

**Submit** **Reset** **Default** **Help**

- 2 In the IP Address box, type the IP address of the computer you want to use as a trap receiver. You can specify up to four trap receivers.
- 3 From the Status box, click Enabled.
- 4 In the Community Strings box, type the trap receiver's SNMP application community strings. (The defaults are "public" for the Read Community String and "private" for the Write Community String.)
- 5 Click Submit.

## Monitoring Switch Activity

The Web Device Manager lets you view traffic, utilization, and error statistics for the switch and for individual ports. For more information on statistics, see “Port Traffic Statistics,” “Port Error Statistics,” and “Packet Analysis” in Chapter 5.

### To view port statistics

- 1 Click the Monitor menu, and then click Port Statistics.
- 2 From the row of options below the page heading, click the option you want to view:
  - Traffic
  - Utilization Graph
  - Errors
  - Packet Analysis

#### Port 1 Statistics - Traffic

[Traffic](#) [Utilization Graph](#) [Errors](#) [Packet Analysis](#)

[Show in new browser](#)

Update Interval:

Link Status: 10Mbps/Half/Enabled (BackPressure)

Utilization: 65%

Last Seen MAC: 12-34-56-78-90-AE

#### Traffic in Bytes

Error-Free Bytes Sent	32234
Error-Free Bytes Received	1873
Total Bytes Received	876521

#### Traffic in Frames

Error-Free Frames Sent	3522
Error-Free Frames Received	4121
Total Frames Received	987628

## Viewing/Changing Switch Information

You can view general information about the switch, such as its MAC address, firmware version, name, location, and contact person. Some of the fields can be updated; others are read-only.

- 1 Click the Configure Stack menu, and then click Stack Settings.

### Stack Settings - Basic

[Basic](#)   [Stack Information](#)   [Advanced](#)

Enter the settings, then click **Submit** to apply the changes on this page.

<b>Switch Name</b>	<input type="text"/>
<b>Location</b>	<input type="text"/>
<b>Contact</b>	<input type="text"/>
<b>MAC Address</b>	00-90-27-39-8D-AB
<b>Boot PROM version</b>	v1.00.05
<b>Firmware version</b>	v1.00.10
<b>Serial Number</b>	6789ABCD

[Submit](#)   [Reset](#)   [Default](#)   [Help](#)

- 2 The Switch Name, Location, and Contact fields allow you to provide additional information about the switch. You can type up to 40 characters in each field. After modifying the settings, click Submit.

## Updating Switch Firmware

The Update Firmware screen sets up the switch to update its firmware from a TFTP server. The actual firmware update occurs while the switch is rebooting.

### To update the switch's firmware

- 1 Click the Reset and Update menu, and then click Update Firmware.

**Update Firmware**

Enter settings, then click Submit to apply the changes on this page.

To start the firmware update, reboot the switch.

Update Mode:	<input type="button" value="Network"/>
TFTP Server Address: <input type="text"/>	
Firmware Update	<input type="button" value="Enabled"/>
File Name	<input type="text"/>

- 2 Select a mode from the Update Mode box.
  - If the switch uses a network connection for downloading the new firmware file, click Network.
  - If the switch uses a SLIP connection for downloading the new firmware file, click SLIP.

- 3 Type the IP address of the server that hosts the file in the TFTP Server Address box.
- 4 Click Enabled from the Firmware Update box.
- 5 In the File Name box, type the name of the firmware file.
- 6 Click Submit.

The next time the switch reboots it downloads and installs the new firmware during the boot process. If you want to view this process, you must use a terminal program and be connected to the switch through the console port.

#### NOTE

If you don't have a TFTP server application, one is provided with Intel Device View (for Windows) and LANDesk® Network Manager.

## To update the switch's configuration file

The configuration file contains information and configuration settings specified by the network administrator. For more information on using configuration files, see “Upload Configuration Image File” in Chapter 5.

- 1 Click the Reset and Update menu and then click Change Configuration File.

### Change Configuration File

Enter settings, then click Submit to apply the changes on this page.

To start using the new configuration file, reboot the switch.

<b>Update Mode:</b>	<input type="button" value="Network"/>
<b>TFTP Server Address:</b> <input type="text"/>	
<b>File Download</b>	<input checked="" type="checkbox"/> Enabled
<b>File Name</b>	<input type="text"/>

- 2 Select a mode from the Update Mode box.
  - If the switch uses a network connection for downloading the new configuration file, click Network.
  - If the switch uses a SLIP out-of-band connection (for example, via a serial port) for downloading the new configuration file, click SLIP.
- 3 Type the IP address of the server that hosts the file in the TFTP Server Address box.
- 4 Click Enabled from the File Download box.
- 5 In the File Name box, type the name of the configuration file.
- 6 Click Submit.

The new configuration settings are applied to the switch upon the next reboot.

## Saving Configuration Changes and Logging Out

Each time you make configuration changes using the Web Device Manager, the switch immediately uses the new settings. However, when you log out of the Web Device Manager, you are prompted to permanently save the current configuration settings.

If you do not save the current configuration settings to the switch's permanent memory, the settings are lost upon the next switch reboot.

### To save changes and log out

- 1 Click Log Out from the menu.

Log Out

The current configuration settings are lost upon the next switch reboot unless you save the changes to the switch's flash memory.

Click Save Now to permanently save the current configuration settings to the switch and close the Web browser window.

Click Do Not Save to close the Web browser window without saving the current configuration settings.

- 2 Click Save Now to save the current configuration settings. The Web browser window closes and you are successfully logged off of the Web Device Manager.

If you click Do Not Save, all current configuration settings are lost the next time the switch is rebooted.



# 5

# Using Local Management

## Overview

Another way to configure the switch is through the Local Management interface. Local Management provides the same functionality as the Web Device Manager using a text-based interface.

## Accessing Management

You can access Local Management two different ways: connect directly to the switch's serial port, or through a Telnet session (using either an IP address you assign or the default IP address of 192.0.2.1).

### Using the serial port

- 1 Use the enclosed null modem cable to connect the serial port of your PC to the serial port of the switch.
- 2 Start a terminal emulation program (such as HyperTerminal\* in Windows\* 2000). Use these communication parameters:

- 9600 baud
- 8 data bits
- 1 stop bit
- No flow control
- No parity

#### NOTE

When running HyperTerminal on Windows 2000, use the **Tab ↵** and **Bksp** keys rather than the arrow keys to move between fields.

#### NOTE

You use the same user name and password to log into Web Device Manager and Local Management.

Press **← Enter** to connect to the Local Management.

- 3 Log on to Local Management. By default, no password or user name is assigned. To assign them, see the section titled User Accounts in this chapter.

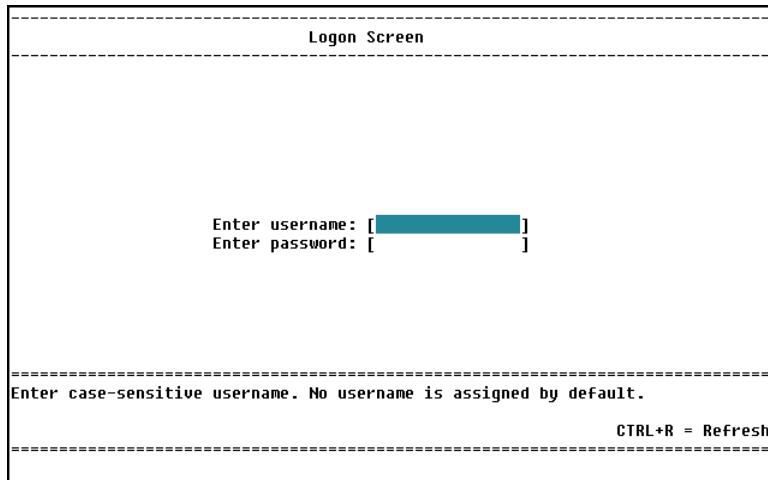
## Using Telnet

### NOTE

Your workstation must be in the same subnet as the switch to Telnet to the switch.

- 1 Open a Telnet application. In Windows 98 or Windows NT\*, select Run from the Start Menu and then type: telnet **[Enter]**.
- 2 From the Terminal menu, select Preferences. Make sure the emulation type is VT-100/ANSI and that VT100 arrows are enabled.
- 3 From the Connect menu, select Remote System. Enter the IP address of the switch and click Connect. (The default IP address is 192.0.2.1.)
- 4 Log on to Local Management. By default, no password or user name is assigned.

## Logon Screen



## Description

By default, no user name or password is assigned to the switch. Press **[Enter]** twice to log on to the Local Manager. User names and passwords can consist of any characters and can be up to fifteen characters in length. Remember that user names and passwords are also case-sensitive.

## Navigation

The console menus provide a basic interface for configuring switch options. The text below the data provides navigation tips.

**IP Settings**

Switch MAC address: 00-90-27-39-00-1D

<b>Current Settings</b>	<b>New Settings</b>
Assign IP:      BOOTP	Assign IP:      <Manual>
IP address:      192.0.2.1	IP address:      [134.134.34.27 ]
Subnet mask:      255.255.255.0	Subnet mask:      [255.255.255.0 ]
Default gateway: 0 .0 .0 .0	Default gateway: [134.134.34.251 ]

**SUBMIT**

Remember to save your changes to the switch's flash memory and reboot the stack for the new IP settings to take effect.

---

Submits the changes and returns you to the Configure Device screen.

CTRL+T = Main Menu (Top)    Esc = Previous screen    CTRL+R = Refresh

Help text at the bottom of the screen provides information on the selected item.

### NOTE

When running HyperTerminal on Windows 2000, use the Tab key rather than the arrow keys to move between fields.

### Screen legend

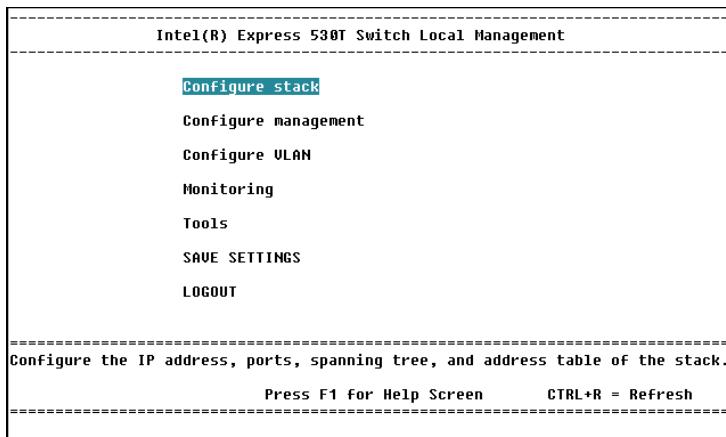
Use the keys or the and keys to move between screen fields.

**<Manual>** Angle brackets indicate a toggle field. Use the to toggle selections within the field. In this example, the options change between Manual, BOOTP (Boot Prom), and DHCP (Dynamic Host Configuration Protocol).

**[255.255.255.0]** Brackets indicate an input field. Select the field with the arrow keys and type the required information. By default, Local Management is in overstrike mode, which means it replaces existing characters as you type.

**SUBMIT** Any word in all caps is a button. Use the key or the keys to select the button, and press to activate it.

## Main Menu (Top Screen)



## Description

### LOCATION

To return to the Main Menu at any time, press **[Ctrl] [T]**.

The Main Menu is the starting point for all other Local Management screens. Use the **↑ ↓** arrow keys to choose an option and press **←→ Enter** to display the screen.

**Configure stack:** Accesses menus to assign an IP address to the stack, change port settings, or configure advanced switch settings.

**Configure management:** Allows you to set SNMP traps and trap monitoring stations, administer user accounts, or update the switch's firmware.

**Configure VLAN:** Set up and administer VLANs on the switch.

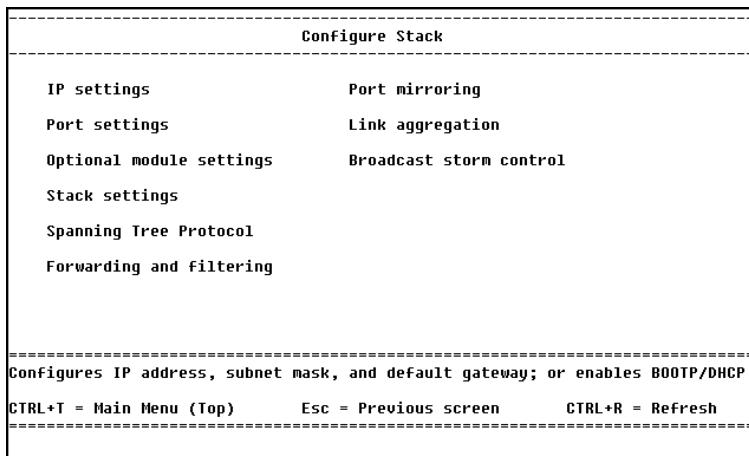
**Monitoring:** Accesses menus to monitor traffic and activity at the port or switch level. They also provide information on network errors and collisions.

**Tools:** View the switch Trap/Event log, ping devices to check connectivity, save the current switch configuration to an image file on a server.

**SAVE SETTINGS:** Saves configuration changes to the switch's flash memory. Any changes not saved to memory are lost on the next reboot.

**LOGOUT:** Returns to the logon screen.

## Configure Stack



### LOCATION

Main Menu  
Configure Stack

### Description

**IP settings:** Configures the switch's (stack's) IP address.

**Port settings:** Configures port speed, enables and disables ports, and displays link status.

**Optional module settings:** Configures the module's speed and duplex settings, enables and disables ports, and displays link status.

**Stack settings:** Sets stack's identification, displays detailed information about the switch hardware and firmware, and configures some advanced switch settings.

**Spanning Tree Protocol:** Configures Spanning Tree for the entire switch or individual ports.

**Forwarding and filtering:** Adds, removes, or locks the switch's address table, enables IGMP snooping, and sets filters for specific MAC addresses.

**Port mirroring:** Sends a copy of data from one port to another for monitoring and troubleshooting purposes.

**Link aggregation:** Combine ports on the switch to increase bandwidth.

**Broadcast storm control:** Configures ports to drop excessive broadcast traffic before it floods the network.

## IP Settings

IP Settings	
Switch MAC address: 00-90-27-39-00-1D	
Current Settings	New Settings
Assign IP: BOOTP	Assign IP: <Manual>
IP address: 192.0.2.1	IP address: [134.134.34.27]
Subnet mask: 255.255.255.0	Subnet mask: [255.255.255.0]
Default gateway: 0 .0 .0 .0	Default gateway: [134.134.34.251]
SUBMIT	
Remember to save your changes to the switch's flash memory and reboot the stack for the new IP settings to take effect.	
Submits the changes and returns you to the Configure Device screen. ====== CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh ======	

### LOCATION

Main Menu  
 Configure Stack  
 IP Settings

### NOTE

The default IP address for the switch is 192.0.2.1

If the 530T is in a stack of switches, there is only one IP address.

Default VLAN for SNMP agent:  
 Port-based: DEFAULT\_VLAN  
 802.1q-based: VID=1

## Description

**Switch MAC address:** The unique hardware address assigned by Intel.

**Current settings:** The switch's current IP configuration.

**New settings:** Assign a new IP configuration to the switch.

- **Assign IP:** Indicates if the switch will use a BOOTP or DHCP server to obtain an IP address dynamically, or if you will assign an address manually.
- **IP address:** The IP configuration used by the switch. Use the IP address shown here to access the switch through Telnet or a ping test.
- **Subnet mask:** Should match the mask for other devices on the network.
- **Default gateway:** The IP address of the device that routes to different networks—typically, a router or routing server. Set this option to manage the switch remotely.
- **VLAN or VLAN ID (port-based or tag-based VLANs only):** Specify a VLAN where the switch's SNMP management agent will reside. This option appears only when port-based and IEEE 802.1Q VLANs are active on the switch.

**SUBMIT:** Submits the changes and returns you to the Configure Device screen. You must save the changes to the switch's flash memory and reboot the switch for the new IP settings to take effect.

## Port Settings

Port Settings					
Select switch: < Control >		Configure ports: < 1 to 12 >			
Port	State	Speed/Duplex	Flow Ctrl	Priority	Link:Speed/Duplex/Flow
1	<Enabled >	<100M/Full>	<Enabled >	<Frame >	10M/Half/Off
2	<Disabled >	<Auto >	Auto	<Frame >	-
3	<Enabled >	<100M/Half>	<Disabled >	<Frame >	100M/Half/Off
4	<Enabled >	<10M/Full >	<Enabled >	<Frame >	-
5	<Enabled >	<10M/Half >	<Enabled >	<Frame >	-
6	<Enabled >	<Auto >	Auto	<Frame >	-
7	<Enabled >	<Auto >	Auto	<Frame >	-
8	<Enabled >	<Auto >	Auto	<Frame >	-
9	<Enabled >	<Auto >	Auto	<Frame >	-
10	<Enabled >	<Auto >	Auto	<Frame >	-
11	<Enabled >	<Auto >	Auto	<Frame >	-
12	<Enabled >	<Auto >	Auto	<Frame >	-
=====					
Blocks the port from receiving or transmitting.					
CTRL+T = Main Menu (Top)			Esc = Previous screen		CTRL+R = Refresh
=====					

### LOCATION

Main Menu  
 Configure Stack  
 Port Settings

### Description

**Select switch:** Press the [Spacebar] to select a switch to configure.

**Configure ports:** Press the [Spacebar] to select a range of ports to configure.

**State:** Press the [Spacebar] to toggle the field and disable or enable ports.

**Speed/Duplex:** Press the [Spacebar] to toggle the field's options and change the speed and duplex of the port. You can set the port to auto-negotiate speed, or to 10Mbps or 100Mbps at half- or full-duplex.

**Flow Ctrl (Control):** Press the [Spacebar] to enable or disable flow control.

**Priority:** Press the [Spacebar] to change the settings. The <Frame> setting reads the packet's 802.1p priority tag and handles it accordingly. The <Low> or <High > settings force the packet into one of two priority queues. Forcing a packet into a queue does not retag the packet.

**Link:** Indicates the port's current link status:

- -- : No device link or port is disabled.
- **10M/100M:** The port's speed, either 10Mbps or 100Mbps.
- **Full/Half:** A device is connected at full- or half-duplex.
- **IEEE/BackP:** The type of flow control, either IEEE PAUSE frames or backpressure.
- **Partitioned:** Port was disabled due to a partition error.
- **Source mirror/Target mirror:** The port being mirrored and where the data is being sent.

## Configure Optional Module

```

Configure Optional Module

Select switch: < Control >

Module A: 1000BaseT Module (2 ports) present

Module Port 1           Module Port 2
State: <Enabled>          State: <Enabled>
Speed/Duplex: <1000Mbps/Full> Speed/Duplex: <100Mbps/Full>
Flow control: <Enabled>     Flow Control: <Enabled>
Priority: <Frame>          Priority: <Frame>
Link (S/D/F): 1000M/Full/IEEE Link (S/D/F): 100M/Full/IEEE

=====
Enables/disables the port.

CTRL+T = Main Menu (Top)   Esc = Previous screen   CTRL+R = Refresh
=====
```

### LOCATION

Main Menu  
 Configure Stack  
 Optional Module...

### NOTE

This screen is for Module A's settings; the Matrix Module is not configurable.

This screen also allows you to configure the Module A ports for any 535T switches in the stack.

1000SX and 1000LX modules connect at 1000Mbps, full-duplex only.

### Description

**Select switch:** Press the **[Spacebar]** to select a switch.

**Module A:** Displays the type of module installed.

**State:** Press the **[Spacebar]** to toggle the field and disable or enable ports.

**Speed/Duplex:** Press the **[Spacebar]** to toggle the field's options and change the speed and duplex of the port. You can set the port to auto-negotiate speed or force to 100Mbps at half- or full-duplex (535T modules only).

**Flow control:** Press the **[Spacebar]** to enable or disable flow control.

**Priority:** Press the **[Spacebar]** to change the settings. The **<Frame>** setting reads the packet's 802.1 priority tag and handles it accordingly. The **<Low>** or **<High>** settings force the packet into one of two priority queues. Forcing a packet into a queue does not retag the packet.

**Link:** Indicates the port's current link status:

- **--:** Indicates no device link or port is disabled.
- **10M/100M/1000M:** The port's speed, either 10Mbps, 100Mbps, or 1000Mbps (535T modules only; 530T modules are 1000Mbps only).
- **Full/Half:** A device is connected at full- or half-duplex.
- **IEEE/BackP:** The type of flow control, either IEEE PAUSE frames or backpressure.
- **Partitioned:** Port was disabled due to a partition error.
- **Source mirror/Target mirror:** The port being mirrored and where the data is being sent.

## Stack Settings

**Configure Stack Settings**

Name:	[Switch 1, Engineering Dept. Location: [4th Floor, Building 2 Contact: [John Adams, System Admin, 555-1212]]]
MAC address:	00-90-27-39-00-1D
Boot PROM version:	v1.00.15
Firmware version:	v1.00.18
Serial number:	00000027

**VIEW STACK INFORMATION**

**CONFIGURE ADVANCED SETTINGS**

---

Sets a name for identification purposes.

CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh

### LOCATION

Main Menu  
 Configure Stack  
 Stack Settings

### NOTE

It's a good idea to write down both the firmware version and Boot PROM version, in case you need to contact Intel Customer Support.

### Description

**Name:** The name of the switch, up to 40 characters long.

**Location:** The location of the switch, up to 40 characters long.

**Contact:** The contact person or phone number for the switch, up to 40 characters long.

**MAC address:** The unique hardware address assigned by Intel.

**Boot PROM version:** The version of the switch's boot code.

**Firmware version:** The version of the firmware installed on the switch. You can update this software through the Update firmware and configuration files screen.

**Serial number:** The hardware serial number for the switch.

**VIEW STACK INFORMATION:** Use this to view information about the control switch (530T) and any member switches (535Ts) in the stack.

**CONFIGURE ADVANCED SETTINGS:** Advanced switch settings such as port auto-partition and Head of Line blocking.

## View Stack Information

View Stack Information	
<b>Control switch:</b>	Intel Express 530T Switch
Module A:	1000BASE-SX 2 port Module Present
Stack Matrix Module	is present
Hardware Version:	Rev. 2 (2)
<b>Member 2 switch:</b>	Intel Express 535T Switch
Module A:	100BASE-FX 2 port MT-RJ Module Present
Hardware version:	Rev. 1 (2)
<b>Member 3 switch:</b>	Intel Express 535T Switch
Module A:	100BASE-FX SC 1 port Module Present
Hardware version:	Rev. 1 (2)
<b>Member 4 switch:</b>	Not Present
Module A:	-----
Hardware version:	-----
<hr/> Displays all switches and optional modules present in the stack.	
<b>CTRL+T</b> = Main Menu (Top)	<b>Esc</b> = Previous screen
	<b>CTRL+R</b> = Refresh

## Description

### LOCATION

Main Menu

- Configure Stack
- Stack Settings
- View Stack...

### NOTE

When the 530T is in a stack with 535T switches, the 530T is the control switch. The other ports are numbered according to how they are plugged into the Matrix Module.

Member Switch 2 = Switch 1

Member Switch 3 = Switch 2

Member Switch 4 = Switch 3

The View Stack Information screen displays information about the control switch (535T) and any member switches (530T) that are in the stack.

**Control switch:** The name of the control switch. This is always Intel Express 530T Switch.

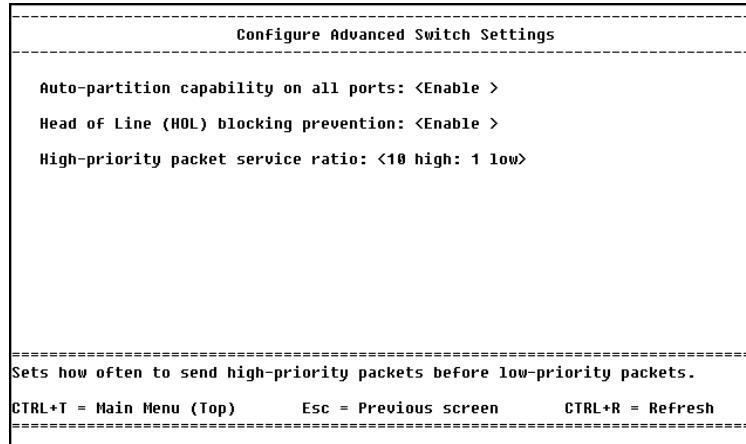
**Module A:** The type of module installed.

**Stack Matrix Module:** A message indicating whether or not the Matrix Module is installed.

**Hardware version:** The hardware version installed on each switch.

**Member X switch:** The module and hardware version for each member switch in the stack.

## Configure Advanced Switch Settings



### LOCATION

Main Menu  
 Configure Stack  
 Stack Settings  
 Configure Advanced...

### Description

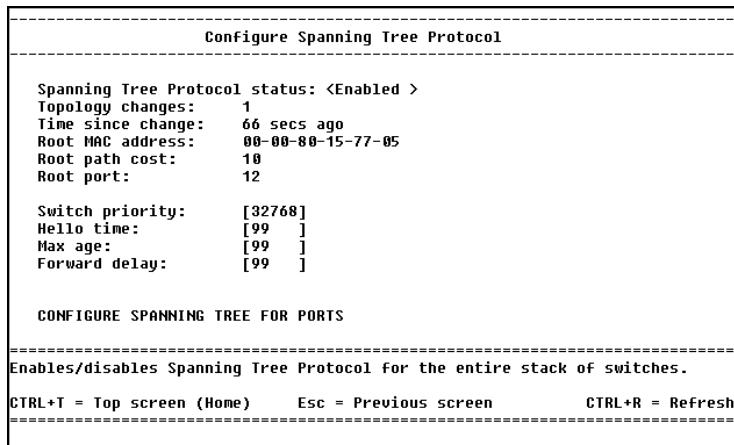
**Auto-partition capability on all ports:** If this option is enabled, the switch partitions the port when more than 61 collisions occur consecutively while receiving data. The first time the switch receives a good packet it then unpartitions the port. If a port is partitioned the switch can transmit data over this port, but not receive data.

**Head of Line (HOL) blocking prevention:** If this option is enabled it prevents the forwarding of data to a port that is blocked. Normally, when the switch sends traffic to a port it goes to the port's transmit queue and then is sent out. If the port's transmit queue is already busy trying to send out data, then the switch will place the waiting traffic in the buffer memory until the port is ready to send it out.

However, if the port's transmit queue remains full, the switch fills up more of the buffer with traffic waiting to be sent on that port. HOL blocking works on the assumption that it is better to drop the traffic waiting in the buffer than to continue using more memory and impacting performance across all the ports.

**High-priority packet service ratio:** This option lets you determine how many high-priority packets are sent out by the switch before sending a low-priority packet. For example, a ratio of 8 high:1 low means that the switch will send out eight high-priority packets before sending out one low-priority packet.

## Configure Spanning Tree Protocol



### LOCATION

Main Menu  
Configure Stack  
Spanning Tree Protocol

### NOTE

Only one instance of Spanning Tree is supported per switch (or per stack).

### Description

The IEEE 802.1D Spanning Tree Protocol specification prevents loops in a network by allowing only one active path between any two network devices at a time.

**Spanning Tree status:** Use the **[Spacebar]** to enable or disable support for the Spanning Tree Protocol, where the entire switch is a bridge for which you can set spanning tree parameters. (Note: If you are running 802.1Q VLANs, spanning tree must be enabled and will be turned on automatically by the switch.)

**Topology changes:** The number of times the spanning tree has changed its configuration.

**Time since change:** The elapsed time (since the last switch reboot) since the spanning tree last changed its topology (the paths used to get through the network).

**Root MAC address, Root path cost, Root port:** Information used by the root bridge in the same spanning tree as the switch.

**Switch priority:** Accepts a number from 0 to 65535 (default is 32768). The device with the lowest number becomes the root device (starting point for the spanning tree).

**Hello time:** Accepts a number from 1 to 10 seconds (default is 2 seconds). This is the time between transmissions of configuration BPDUs (Bridge Protocol Data Units) when the switch is, or is attempting to become, the root in the spanning tree.

**Max age:** Type a number from 6 to 40 seconds (default is 20 seconds). This is the maximum time that information from a configuration BPDU is used by the switch before it is discarded.

**Forward delay:** Type a number from 4 to 30 seconds (default is 15 seconds). This is the amount of time between port states when the spanning tree is changing its status from blocking to forwarding.

**CONFIGURE SPANNING TREE FOR PORTS:** Takes you to the screen where you can set spanning tree values for individual ports.

## Configure Spanning Tree for Ports

Configure Spanning Tree Protocol for Ports								
Select switch: < Control >								
Port	STP State	Cost	Priority	Port	STP State	Cost	Priority	
1	<Enable >	[10 ]	[128 ]	13	<Enable >	[10 ]	[128 ]	
2	<Disable>	[10 ]	[128 ]	14	<Enable >	[10 ]	[128 ]	
3	<Disable>	[10 ]	[128 ]	15	<Enable >	[10 ]	[128 ]	
4	<Disable>	[10 ]	[128 ]	16	<Enable >	[10 ]	[128 ]	
5	<Enable >	[10 ]	[128 ]	17	<Enable >	[10 ]	[128 ]	
6	<Enable >	[10 ]	[128 ]	18	<Enable >	[10 ]	[128 ]	
7	<Enable >	[10 ]	[128 ]	19	<Enable >	[10 ]	[128 ]	
8	<Enable >	[10 ]	[128 ]	20	<Enable >	[10 ]	[128 ]	
9	<Enable >	[10 ]	[128 ]	21	<Enable >	[10 ]	[128 ]	
10	<Enable >	[10 ]	[128 ]	22	<Enable >	[10 ]	[128 ]	
11	<Enable >	[10 ]	[128 ]	MP-1	<Enable >	[10 ]	[128 ]	
12	<Enable >	[10 ]	[128 ]	MP-2	<Enable >	[10 ]	[128 ]	

Enables or disables Spanning Tree for each port.

CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh

### LOCATION

Main Menu

- Configure Stack
- Spanning Tree Protocol
- Configure STP for...

### Description

**Select switch:** The switch you want to configure for spanning tree.

**STP State:** Use the **Spacebar** to enable or disable each port to be active in the spanning tree.

**Cost:** Accepts a number from 1 to 65535 (default is 10). This value is used by the Spanning Tree Protocol to determine alternate routes in the network to forward traffic. The higher the cost of a port, the lower the chance of this port being used to forward traffic. When possible, assign a port a low cost if it is connected to a fast network segment.

**Priority:** Accepts a number from 0 to 255 (default is 128) to set the port's priority in the spanning tree. The higher the value, the lower the chance of this port being used as the root port. If two ports on the switch have the same priority value, the spanning tree uses the port with the lowest number. For example, the spanning tree would choose port 1 over port 4 if they both had the same priority setting.

## Forwarding and Filtering

```

Forwarding and Filtering

Lock address table (stops learning): <No >
MAC address aging (sec): [300 ]
Configure IGMP snooping
Configure static MAC addresses (forwarding)
Configure port security
Configure MAC address filtering
Configure Ethernet multicast filtering

=====
Prevents the switch from learning addresses automatically.

CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh
=====
```

### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering

### Description

**Lock address table:** Use the **[Spacebar]** to toggle field values. <Yes> prevents the switch from learning new MAC addresses. Any existing addresses that the switch has learned remain in the address table.

**MAC address aging:** Sets the time interval at which the switch scans its MAC address table to determine the age of entries.

**Configure IGMP snooping:** Sets Internet Group Management Protocols (IGMP) options for multimedia applications, such as desktop video conferencing, that use IP multicast addresses.

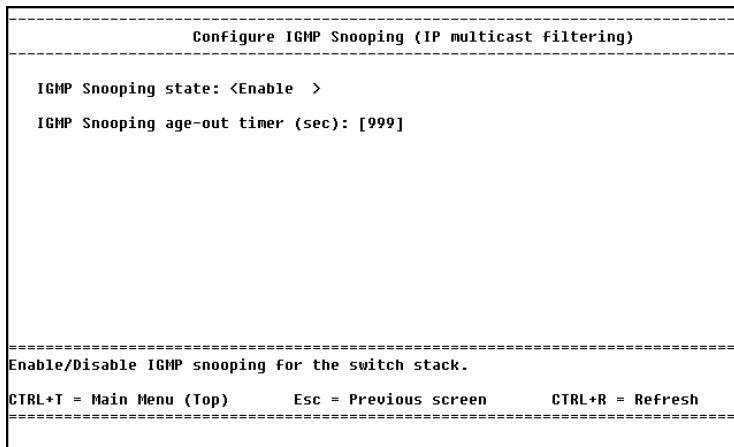
**Configure static MAC addresses (forwarding):** Allows permanent mapping between a network device and a port.

**Configure port security:** Configures the switch to allow the transmission of authorized traffic only over a particular port.

**Configure MAC address filtering:** Allows the switch to drop traffic from a specific source.

**Configure Ethernet multicast filtering:** Blocks or forwards traffic over each port for Ethernet (MAC-based) multicast groups.

## Configure IGMP Snooping



### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 IGMP Snooping

### NOTE

If tag-based (IEEE 802.1Q) or port-based VLANs are currently running and you want to enable IGMP snooping for any of the VLANs, you must enable IGMP snooping for each VLAN separately. The switch supports a maximum of 24 VLAN IGMP snooping sessions.

### Description

IGMP Snooping (Internet Group Management Protocol) is a feature that allows the switch to forward multicast traffic intelligently. The switch “snoops” the IGMP query and report messages and forwards traffic only to the ports that request the multicast traffic. This prevents the switch from broadcasting the traffic to all ports and possibly affecting network performance.

IGMP requires a router that learns about the presence of multicast groups on its subnets and keeps track of group membership. Multicasting is not connection oriented, so data is delivered to the requesting hosts on a best-effort level of service.

**VLAN name (when port-based or tag-based VLANs are running):** The VLAN for which IGMP snooping is enabled. You can also enable IGMP snooping for a VLAN in the Configure VLAN section.

**IGMP snooping state:** Use the **[Spacebar]** to enable or disable IGMP Snooping.

**IGMP snooping age-out timer:** Specify the acceptable time (in seconds) between IGMP queries since the switch last received an IGMP query from the multicast server. The default time is 300 seconds. A query allows the server to determine which network hosts are (or want to be) part of the IP multicast group, and are configured and ready to receive traffic for the given application.

## Configure Static MAC Addresses

Configure Static MAC Addresses		
Modify Address Table		Static Entries      Switch/Port
Enter MAC:	[000000000000]	00A0C9680F90      Mem2/08
Select switch: < Control >		00A0A00123456      Mem2/09
Select port: < Port 1 >		00A0C9680F98      Mem2/20
ADD      DELETE		00A0C9681312      Mem3/15
Total entries: 2001		00A0C9681330      Mem3/18
		00A0C968133F      Mem3/20
		00A0C9681341      Mem3/22
		00A0C9681481      Mem4/01
		00A0C96814E5      Mem4/06
		00A0C9681552      Mem4/11
		00A0C9681579      Mem4/21
		- More -
Enter a MAC address on a port so it is never removed from the address table.		
Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh		

### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 Configure Static MAC...

### Description

Static MAC addresses are MAC addresses that remain in the switch's address table, whether the device is physically connected to the switch. After you define a static MAC address, it remains in the switch's address table until you remove it.

**Enter MAC:** Type the MAC address you want to permanently add to the address table.

**VLAN or VLAN ID (when port-based or tag-based VLANs are running):** When VLANs are active on the switch you can define static MAC addresses for each VLAN. If port-based VLANs are active press the **[Spacebar]** to select a VLAN. If tag-based VLANs are active type the VLAN ID that the static MAC address will be assigned to.

### NOTE

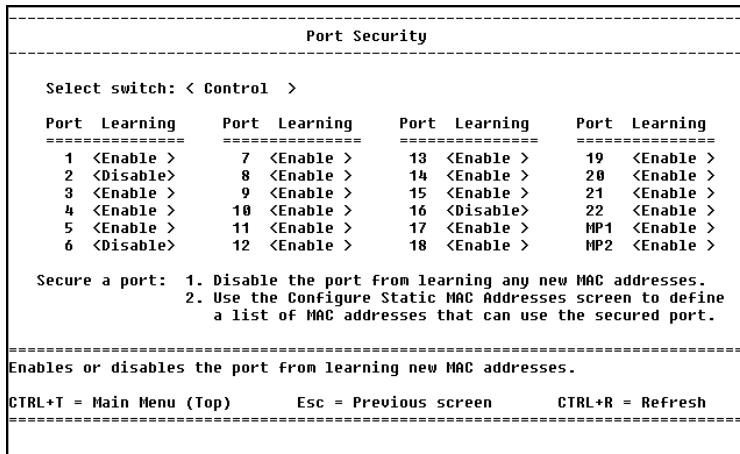
If tag-based or port-based VLANs are currently running, you must assign each static MAC address to a specific VLAN.

**Select switch:** Use the **[Spacebar]** to select the switch you want to configure.

**Select port:** Use the **[Spacebar]** to select a port on the switch where the switch forwards traffic.

**ADD/DELETE:** Use these buttons to add or remove a MAC address from the switch's table.

## Configure Port Security



### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 Configure Port...

### NOTE

You must first configure port security and then configure a static MAC address.

## Description

Port security prevents unauthorized access of a port by “securing” a list of specific MAC addresses to a port. If the switch sees a MAC address that is not on the secured list, it discards the traffic.

### To set port security from Local Management

- From the Configure Device screen, select Forwarding and Filtering.
- From the menu select Configure Port Security.
- Press the **Spacebar** to select the switch you want to configure.
- Select a port you want to secure. Press **Spacebar** in the Learning field to disable the port’s ability to learn new MAC addresses.
- Press **Esc** to move up a level and select the Configure Static MAC Addresses screen.
- Define a list of MAC addresses and assign them to the same port you secured in the Port Security screen.

### To turn off port security

- From the Configure Device screen, select Forwarding and Filtering. Select Configure Port Security from this menu.
- Press the **Spacebar** to select the switch you want to configure.
- Select the port on which you want to disable security. Press the **Spacebar** in the Learning field to disable security and allow the port to learn new MAC addresses.

## Configure MAC Address Filter Table

Configure MAC Addresses Filter Table	
<b>Add a Filter</b>	<b>Filtered Addresses</b>
=====	
Enter MAC: [000000000000]	
=====	
ADD	DELETE
Total entries: 2031	
00027000002 0008C9680F90 00AA00123456 00A0C9680F98 00A0C9681330 00A0C9681481 00AA0C18FB90 00A98U700C28 009068000346 005011000200 00C266110004 00B426002492 - More -	
=====	
Type a MAC address to filter on the switch.	
Esc = Previous screen N = Next Page P = Prev Page CTRL+R = Refresh	
=====	

### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 Configure MAC...

### Description

MAC address filtering allows the switch to drop unwanted traffic. The switch will drop any traffic when it sees the specified MAC address in either the source address or destination address of the incoming packet. For example, if your network is congested because of high utilization from a specific MAC address, you can filter all traffic transmitted from that address and restore network flow, while you troubleshoot the problem.

**Enter MAC:** Type the MAC address you want to filter.

**VLAN/VLAN ID (when port-based or tag-based VLANs are running):** If VLANs are active on the switch you can set MAC address filtering on a per VLAN basis. For port-based VLANs, press the **[Spacebar]** to select the name of VLAN. For tag-based VLANs, type in the VLAN ID where the MAC address belongs.

**ADD:** Press **[Enter]** to activate the filter and add the MAC address to the list.

**DELETE:** Press **[Enter]** to remove the filter for the specified MAC address.

### NOTE

If tag-based (IEEE 802.1Q) or port-based VLANs are currently running, you must assign each MAC address filter to a specific VLAN.

## Configure Ethernet Multicast Filtering

Configure Ethernet Multicast Filtering (802.1Q VLAN)			
<b>Create/Remove a Filter</b> <hr/> Multicast address: [00AA00000000] VLAN ID: [0025]		<b>Modify a Multicast Filter</b> <hr/> Select a filter from the list to modify the settings	
ADD      DELETE		Current Filters      VLAN ID	
		C3A5E9680E90      0005 D2A3C9681338      0110 F0A1D968358E      0118	
To create: Enter the address and VID then select ADD To remove: Enter the address and VID then select DELETE			
Use the arrow keys to select a multicast filter. Press Enter to edit. Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh			

### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 Ethernet Multicast...

### NOTE

If tag-based (IEEE 802.1Q) or port-based VLANs are currently running, you must assign each multicast filter to a specific VLAN.

### Description

Ethernet multicast filters allow you to define which ports can receive ethernet multicast traffic from a specific multicast MAC address. This is similar to IGMP snooping, except you define everything manually.

**Multicast address:** Type the MAC address to which you want to apply a filter.

**VLAN/VLAN ID:** If VLANs are active on the switch you can set Ethernet Multicast filtering on a per-VLAN basis. For port-based VLANs, press the **[Spacebar]** to select the name of VLAN. For tag-based VLANs, type in the VLAN ID where the multicast address belongs.

**ADD:** Press **[Enter]** to activate the filter and add the address to the list.

**DELETE:** Press **[Enter]** to remove the filter for the specified address.

### Adding/Deleting a multicast filter

- 1 In the Multicast address field, type a multicast address.
- 2 If the switch is running tag-based or port-based VLANs, select a VLAN to locate the filter.
- 3 Select ADD using the arrow keys and press **[Enter]**.
- 4 To remove a filter, type in the MAC address in the Multicast field, select DELETE, and press **[Enter]**.

## Ethernet Multicast Filtering (Ports)

**Configure Ethernet Multicast Filtering**

---

Select Switch: < Control >

Multicast address: C3A5E9680E90

Port	Action	Port	Action	Port	Action	Port	Action
1	<Forward>	7	<Block>	13	<Forward>	19	<Forward>
2	<Forward>	8	<Forward>	14	<Forward>	20	<Block>
3	<Block>	9	<Block>	15	<Block>	21	<Block>
4	<Forward>	10	<Forward>	16	<Forward>	22	<Block>
5	<Block>	11	<Forward>	17	<Block>	MP1	<Block>
6	<Block>	12	<Block>	18	<Block>	MP2	<Forward>

APPLY CHANGES

---

Sets the switch to forward or block traffic to this port.

Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh

---

### Description

**Select switch:** Press the **[Spacebar]** to select a switch to configure.

**Multicast address:** Displays the multicast address you want to filter.

**Action:** Use the **[Spacebar]** to select whether to block or forward traffic to the selected port.

**APPLY CHANGES:** Applies the changes to the multicast filter once you have configured the ports.

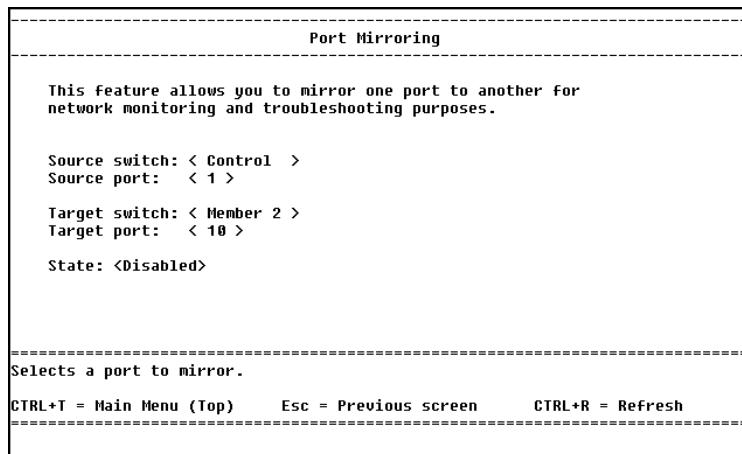
### Modifying a multicast filter

- 1 Under the Configure Ethernet Multicast Filter screen use the arrow keys to select an address from the list on the right side of the screen. Press **[Enter]**.
- 2 Decide which ports should receive the multicast traffic by using the **[Spacebar]** to set Forward or Block for each port.
- 3 Select **APPLY CHANGES** and press **[Enter]**. This activates the changes to the multicast filter and returns you to the previous screen.

### LOCATION

Main Menu  
 Configure Stack  
 Forwarding and Filtering  
 Ethernet Multicast...  
 Multicast Filters...

## Port Mirroring



### LOCATION

Main Menu  
Configure Stack  
Port Mirroring

### CAUTION

Do not mirror traffic to a target port that is connected to network devices other than a protocol analyzer. Their behavior may be unpredictable.

If a port is part of an aggregated link, it cannot be configured as the target port for a port mirror. However, a port in an aggregated link can serve as the source port for a port mirror.

## Description

Port mirroring is a useful diagnostic tool because it allows you to send a copy of the good Ethernet frames transmitted or received on one port to another port. On the second port you can attach a protocol analyzer to capture and analyze the data without interfering with the client on the original port.

**Source switch:** Use the **[Spacebar]** to select the switch you want to configure.

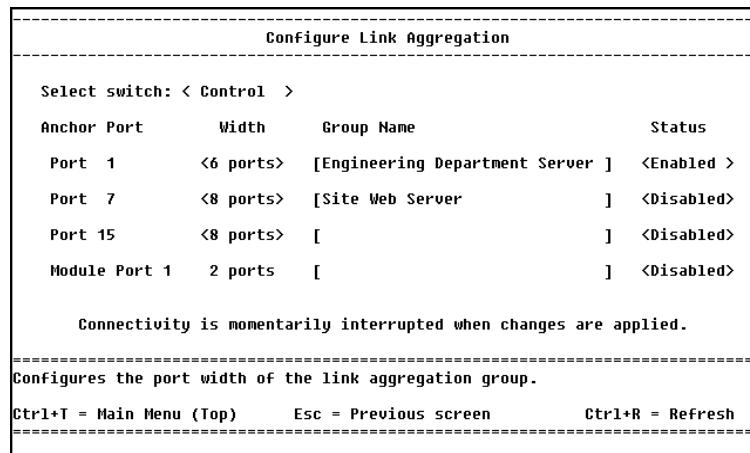
**Source port:** Use the **[Spacebar]** to select the port whose traffic you want to mirror.

**Target switch:** Use the **[Spacebar]** to select the switch you want to receive mirrored traffic.

**Target port:** Use the **[Spacebar]** to select a port to receive the mirrored traffic. This is a port to which you have connected a protocol analyzer.

**State:** Use the **[Spacebar]** to enable or disable the port's mirror.

## Link Aggregation



### LOCATION

Main Menu  
 Configure Stack  
 Link Aggregation

### Description

Link aggregation is a way of combining ports on the switch to increase the available bandwidth and provide redundancy. All ports in the aggregated link take on the characteristics of the anchor port. This means that if you set the anchor port to 100Mbps full duplex, all the ports aggregated to that anchor port will share the same setting.

**Select switch:** Use the **Spacebar** to set the switch you want to configure.

**Anchor Port:** This shows the first port in the link aggregation.

**Width:** Use the **Spacebar** to set the total number of (consecutive) member ports in the aggregated link. The minimum number of ports for an aggregated link is two, and the maximum is eight. The link aggregation width includes the anchor port.

**Group Name:** Assigns a name to the aggregated links for management or identification purposes.

**Status:** Use the **Spacebar** to enable or disable the aggregated link.

### NOTE

All custom settings for a port (including VLAN membership) are lost when you add that port to a link aggregation.

You cannot link aggregate ports from different switches in the stack.

## Broadcast Storm Control

Broadcast Storm Control - Port Settings							
Select switch: < Control >							
Port	Setting	Upper	Threshold	Port	Setting	Upper	Threshold
1	<Enabled >	[ 20 ]%		13	<Enabled >	[ 20 ]%	
2	<Enabled >	[ 20 ]%		14	<Enabled >	[ 20 ]%	
3	<Enabled >	[ 20 ]%		15	<Enabled >	[ 20 ]%	
4	<Disabled>	[ 20 ]%		16	<Enabled >	[ 20 ]%	
5	<Enabled >	[ 20 ]%		17	<Enabled >	[ 20 ]%	
6	<Disabled>	[ 20 ]%		18	<Enabled >	[ 20 ]%	
7A	<Enabled >	[ 20 ]%		19	<Enabled >	[ 20 ]%	
8	-	-		20	<Enabled >	[ 20 ]%	
9	-	-		21	<Enabled >	[ 20 ]%	
10	-	-		22	<Enabled >	[ 20 ]%	
11	-	-		MP1	<Enabled >	[ 20 ]%	
12	-	-		MP2	<Enabled >	[ 20 ]%	

Sets the threshold value for the broadcast traffic.

CTRL+T = Main Menu (Top)    Esc = Previous screen    CTRL+R = Refresh

### LOCATION

Main Menu  
 Configure Stack  
 Broadcast Storm Control

### Description

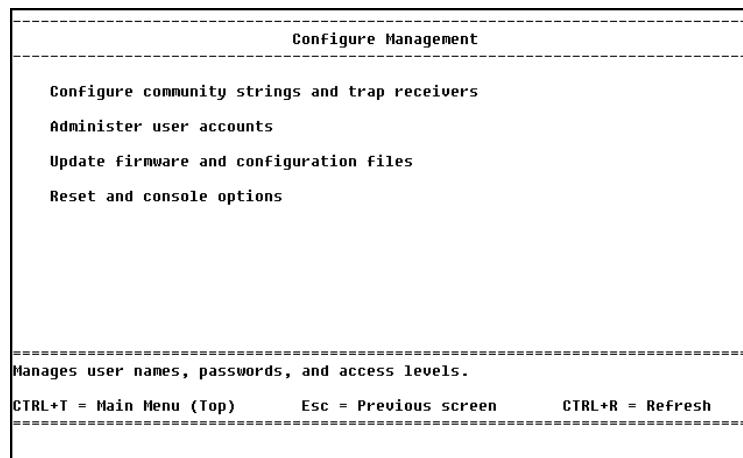
This feature allows you to filter out broadcasts from faulty devices and prevent them from degrading network performance.

**Select switch:** Use the **Spacebar** to select the switch to configure.

**Setting:** Use the **Spacebar** to enable or disable broadcast storm control on this port.

**Upper Threshold:** Accepts a value from 1-20%. The default value is 20%. This control lets you set the threshold of broadcast traffic on a port (shown as a percentage of the port's total bandwidth) that will activate broadcast storm control. When the amount of broadcast traffic on the port exceeds the upper threshold, the port drops all broadcast traffic. When broadcast traffic falls down below the threshold the switch will automatically start forwarding broadcast traffic again.

## Configure Management



### LOCATION

Main Menu  
Configure Management

### Description

**Configure community strings and trap receivers:** Sets the switch's community strings and specify trap monitoring stations.

**Administer user accounts:** Use this menu to configure user accounts. You can add or delete users, update passwords, and change a user's access rights.

**Update firmware and configuration files:** Configures the switch's internal software and to specify the location of configuration files.

**Reset and console options:** Reboots the switch or changes the settings on the serial port. You can also use this menu to set the switch back to its factory defaults.

## Community Strings and Trap Receivers

```

=====
Community Strings and Trap Receivers

Community Strings
  Current read community: [public] ]
  Current write community: [private] ]

Trap Receiving Stations
  Station IP Address      Community String      State
  [124.123.122.50]  [private] ] <Enabled>
  [0.0.0.0]           [ ]          ] <Disabled>
  [0.0.0.0]           [ ]          ] <Disabled>
  [0.0.0.0]           [ ]          ] <Disabled>

=====
Sets the read community string. Use for security purpose.

CTRL+T = Main Menu (Top)   Esc = Previous screen   CTRL+R = Refresh
=====
```

### LOCATION

Main Menu  
 Configure Management  
 Community Strings and...

### NOTE

The switch supports these traps:

- Power to the switch was cycled or reset.
- Link, speed, or other status changes on a port.
- Spanning Tree topology changes.
- A port is partitioned.
- Authentication failure.

### Description

Use this screen to send alerts to PCs with SNMP management applications (such as OpenView\*) installed.

- **Current read community:** Sets a password for viewing (not changing) the switch configuration. The string you define here must match the read community string defined in an SNMP application. The default read community string is “public.”
- **Current write community:** Sets a password for viewing and changing the switch configuration. The string you define here must match the write community string defined in an SNMP application. The default write community string is “private.”

**Trap Receiving Stations:** When an event occurs, the switch automatically alerts the SNMP management application by sending a trap to the SNMP management stations (for example, PCs) defined here.

- **Station IP Address:** The IP addresses of PCs with SNMP applications (such as Intel® Device View or LANDesk Network Manager) installed.
- **Community string:** Type a string for the trap that matches the community string defined in the SNMP management application. If you don’t define one, the default is “public.”
- **State:** Enables or disables sending of traps to the specified trap receiver.

## User Accounts

User Accounts															
<b>Add Users/Change Passwords</b> Username: [123456789012345]    New password: [*****] Old password: [*****]    Confirm password: [*****] Access Level: <Administrator>															
<b>APPLY CHANGES</b>															
<b>Modify Current Accounts</b> <table border="1"> <thead> <tr> <th>User Name</th> <th>Access Level</th> <th>Delete</th> </tr> </thead> <tbody> <tr> <td>123456789012345</td> <td>&lt;Administrator&gt;</td> <td>&lt;N/A&gt;</td> </tr> <tr> <td>123456789012345</td> <td>&lt;Normal User &gt;</td> <td>&lt;Yes&gt;</td> </tr> <tr> <td>123456789012345</td> <td>&lt;Administrator&gt;</td> <td>&lt;No &gt;</td> </tr> </tbody> </table>				User Name	Access Level	Delete	123456789012345	<Administrator>	<N/A>	123456789012345	<Normal User >	<Yes>	123456789012345	<Administrator>	<No >
User Name	Access Level	Delete													
123456789012345	<Administrator>	<N/A>													
123456789012345	<Normal User >	<Yes>													
123456789012345	<Administrator>	<No >													
<b>APPLY CHANGES</b>															
<hr/> Type the user's name. <hr/> CTRL+T = Main Menu (Top)    Esc = Previous screen    CTRL+R = Refresh <hr/>															

### LOCATION

Main Menu  
 Configure Management  
 Administer User Accounts

### Description

#### Add Users/Change Passwords

- Username:** By default, no username is assigned. Usernames can consist of any character and can be up to fifteen characters long. You can define three usernames.
- Old password:** Used when changing the password of a current user. If this is a new account, you can skip over to the New password field. By default, no password is assigned.
- New password:** Sets a new password for accessing Local Management. The one you specify here is used the next time you reset the switch or log out and log in on Local Management. Passwords are case-sensitive and can be up to fifteen characters long.
- Confirm password:** Verifies the entry in the New password field.
- Access level:** Use the **Spacebar** to determine a user's access rights. Administrators can make any changes to Local Management. All other users (categorized under Normal user) can view information but cannot make changes. To change a user's access rights, see Modify User Accounts.
- APPLY CHANGES:** Select this button to save changes when adding users or changing passwords.

### Modify User Accounts

**Access level:** Use the [Spacebar] to change access rights for the user.

**Delete:** The default value is <No>. To delete an account, use the [Spacebar] to change the value to <Yes>.

**APPLY CHANGES:** Saves changes when modifying or deleting user accounts.

## How to Manage User Accounts

System Administrators can create up to three user accounts for managing the switch. You can also change the access rights for current users and delete user accounts. Make sure you always set up at least one Administrator account.

### To create a user account

- 1 From the Main Menu, select Configure Management. Under this menu select Administer User Accounts and press [Enter].
- 2 On the User Accounts screen, type the name of the new user in the Username field and press [Enter].
- 3 Since this is a new user, press [Tab ↩] to skip the Old password field and go to the New password field.
- 4 Type the password for the new user and press [Enter]. Passwords are case-sensitive and can be up to eight characters long.
- 5 To confirm the new password, retype it in the Confirm new password field. Press [Enter].
- 6 To select the access rights for the new user, press the [Spacebar].
- 7 To save the information, press [Tab ↩] to select SAVE CHANGES (below the Confirm new password field) and press [Enter]. The new account appears in the list under Modify User Accounts.

## To change a password

- 1 From the Main Menu, select Configure Management, press **[← Enter]**. Under this screen, select Administer User Accounts and press **[← Enter]**.
- 2 In the Username field, type the username of the account for which you want to change the password. Press **[← Enter]**.
- 3 Type the current password in the Old password field and press **[← Enter]**.
- 4 Type the new password in the New password field and press **[← Enter]**.
- 5 To confirm the password and retype it in the Confirm new password field, press **[← Enter]**.
- 6 To save the new password, press **[Tab ↵]** to select SAVE CHANGES (below the Confirm new password field) and press **[← Enter]**.

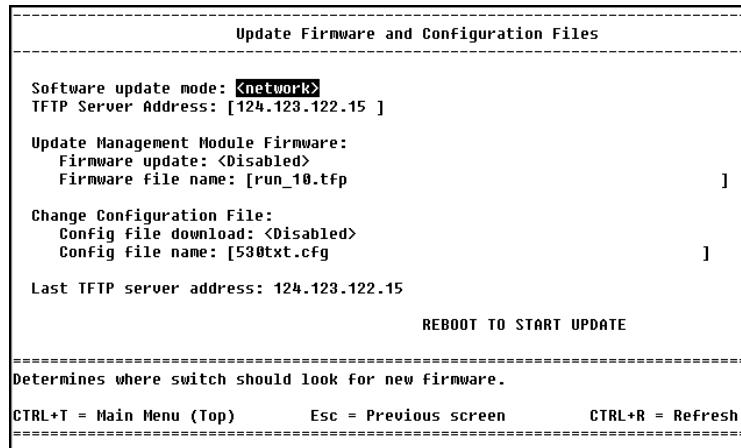
## To modify a user's access level

- 1 From the Main Menu, select Configure Management, press **[← Enter]**. Under this screen select Administer User Accounts and press **[← Enter]**.
- 2 Press **[Tab ↵]** to select the account to be modified under Access Level.
- 3 Press the **[Spacebar]** to change the user's access rights. Users with Administrator access can make changes to the management configuration; users with Normal User access can view the configuration but cannot make changes.
- 4 To save changes, press **[Tab ↵]** to select SAVE CHANGES at the bottom of the screen and press **[← Enter]**.

## To delete a user account

- 1 From the Main Menu, select Configure Management, press **[← Enter]**. Under this screen, select Administer User Accounts and press **[← Enter]**.
- 2 Select the account to be removed under Delete.
- 3 Press the **[Spacebar]** to toggle the field from <No> to <Yes>.
- 4 To remove the user account, press **[Tab ↵]** to select SAVE CHANGES at the bottom of the screen and press **[← Enter]**.

## Update Firmware and Configuration Files



### LOCATION

Main Menu  
Configure Management  
    Update Firmware and...

### NOTE

Check Intel's Customer Support Web site for firmware updates to the 530T switch.

## Description

**Software update mode:** Use the **[Spacebar]** to select whether to update the switch's firmware over the network or through a SLIP connection.

**TFTP server address:** IP address of the server used as the TFTP server.

### Update Management Module Firmware

- **Firmware update:** Use the **[Spacebar]** to enable or disable the firmware update. When enabled, the switch searches for the TFTP server specified at the top of the screen and attempts to update the firmware.
- **Firmware file name:** Path and filename of the firmware located on the server.

### Change Configuration File

- **Config file download:** Use the **[Spacebar]** to enable or disable the ability to download a configuration file. When this field is enabled, the switch searches the TFTP server specified at the top of the screen.
- **Config file name:** Path and filename of the configuration file located on the server.

**Last TFTP server address:** The IP address of the last TFTP server accessed by the switch.

**REBOOT TO START UPDATE:** Starts the update process. The switch reboots and downloads the specified file.

## Reset and Console Options

```

-----+-----+-----+-----+-----+-----+
          Reset and Console Options
-----+-----+-----+-----+-----+-----+
Reset Option:
  Reboot stack: RESET NOW

  Reset stack settings to factory defaults: <No >

Serial Port Settings
  Port setting:   <Console>           Current setting: Console
  Console timeout: <30 mins>           Current timeout: 60 mins

-----+-----+-----+-----+-----+-----+
(* ) Changes become effective on next switch reboot.

-----+-----+-----+-----+-----+-----+
Sets the timeout interval in 15 min increments. 0 min is no timeout.

CTRL+T = Main Menu (Top)    Esc = Previous screen    CTRL+R = Refresh
-----+-----+-----+-----+-----+-----+

```

### LOCATION

Main Menu  
 Configure Management  
 Reset and Console Options

### Description

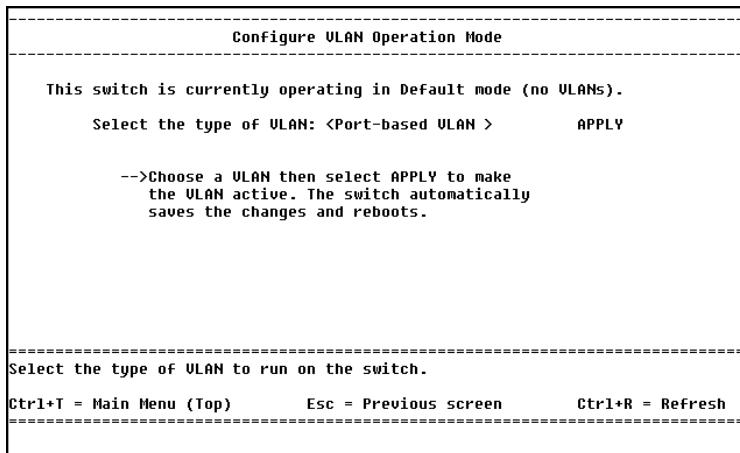
#### Reset Option

- **Reboot stack:** Resets the stack. If you changed the IP configuration or login setting, the new settings take effect after you select this option.
- **Reset stack settings to factory defaults:** This clears any IP address or current changes and resets the stack back to its factory defaults. All counters are cleared and the switch starts sending BOOTP requests.

#### Serial Port Settings

- **Port setting:** Configures the switch's serial port for out-of-band (SLIP) management. Press the **[Spacebar]** to toggle the field from <Console> to <SLIP>. Settings take effect on the next reboot.
- **Console timeout:** Logs out a user after a period of inactivity. Settings are from 0-90 minutes in 15-minute increments. A setting of <0 mins> means no timeout. The default is 60 minutes.

## Configure VLAN Operation Mode



### LOCATION

Main Menu

Configure VLAN  
(if switch is in Default Mode)

### Description

This screen allows you to activate or change the type of VLAN operating on the switch. If there are no VLANs active on the switch, this is the first screen displayed when you select Configure VLAN from the Main Menu. By default, VLANs are not active on the Express 530T switch so they must be turned on before you can start configuring them.

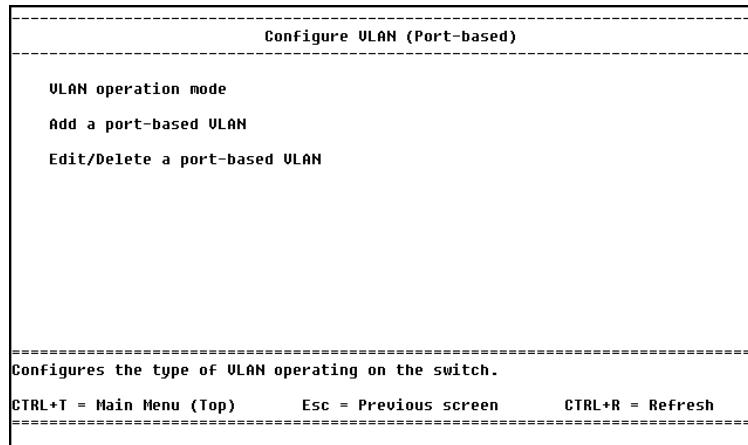
The Express 530T supports only a single type of VLAN operating at a time. However, you can have multiple VLANs of the same type.

**Select the type of VLAN:** Press **[Spacebar]** to change the type of VLAN on the switch. The 530T switch supports two types of VLANs: port-based and IEEE 802.1Q (tag-based) VLANs.

**APPLY:** Makes the changes to the VLAN active and reboots the switch.  
Note: To change between VLAN types the switch must be rebooted.

- 1 Select Configure VLAN from the Main Menu.
- 2 From the Configure VLAN menu, select VLAN Operation Mode.
- 3 Press **[Spacebar]** to change the type of VLAN on the switch. Press **[Enter]**.
- 4 Select the **APPLY** button and press **[Enter]**. This reboots the switch and changes the VLAN mode.

## Configure Port-based VLANs



### LOCATION

Main Menu  
Configure VLAN

### NOTE

You can have a maximum of 24 port-based VLANs on the switch.

VLAN membership can span between the switches in a stack. (Ports from any switch in a stack can be members of a VLAN.)

### Description

A port-based VLAN allows you to create multiple VLANs each with its own broadcast domain and member ports. For example, if port 5 is in VLAN\_1 and port 10 is in VLAN\_2 the two ports cannot communicate with each other even though they are part of the same switch. Ports can be members of only a single port-based VLAN. Any port that is not a member of a user-defined VLAN is a member of the DEFAULT\_VLAN.

**VLAN operation mode:** Changes the type of VLAN operating on the switch, or disables VLANs entirely.

**Add a port-based VLAN:** Creates a port-based VLAN and adds ports to the VLAN.

**Edit/Delete a port-based VLAN:** Selects a VLAN to change port membership in the VLAN, or removes a VLAN from the switch.

## Add a Port-based VLAN

**Create a Port-based VLAN**

VLAN name: [ENGR_VLAN ]							
Select switch: < Control >							
Port	Member	Port	Member	Port	Member	Port	Member
=====	=====	=====	=====	=====	=====	=====	=====
1	<Yes>	7	<No >	13	<Yes>	19	<Yes>
2	<No >	8	<Yes>	14	-	20	<No >
3	<No >	9	N/A	15	-	21	<No >
4	<No >	10	<Yes>	16	-	22	<No >
5	<Yes>	11	<Yes>	17	-	MP1	<No >
6	<Yes>	12	N/A	18	<No >	MP2	<No >

APPLY

---

Select 'Yes' or 'No' to add or remove each port from the VLAN.

CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh

### LOCATION

Main Menu  
 Configure VLAN  
 Add a Port-based VLAN

### Description

**VLAN name:** This field allows you to assign a name to the VLAN. Names can consist of any character (no spaces) and be up to 12 characters long. After a VLAN is created the name cannot be changed. If you want to change the name you need to delete the VLAN, create a new one, and assign the ports to the new VLAN.

**Select switch:** Press the Spacebar to select a switch to configure.

**Member:** Determines which ports will participate in the VLAN being created. Ports can be members of only one port-based VLAN. Press the Spacebar to toggle the field for the following options:

- <Yes>: The port will be a member of the VLAN
- <No >: The port will not be a member of the VLAN.
- - : The port is part of an aggregated link.
- N/A : The port is already participating in another VLAN. Ports can belong to only one VLAN.

**APPLY:** Select this button and press Enter to create the VLAN and activate the settings.

## To create a port-based VLAN

- 1 Select Configure VLAN from the Main Menu.

**Note:** Make sure the switch's current VLAN operation mode is set to port-based VLAN. If another type of VLAN is running, refer to "Configure VLAN Operation Mode" in Chapter 5 to change the VLAN operation mode.

- 2 Select Add a Port-based VLAN and press **[Enter]**.
- 3 Type a name for the new VLAN and press **[Enter]**.
- 4 Select the switch whose ports you want to be members of the VLAN, using the **[Spacebar]** to toggle between switches.
- 5 Select ports to add to the VLAN by using the **[Spacebar]** to toggle the Member field to Yes.
- 6 Select the APPLY button and press **[Enter]**.

### NOTE

Ports from any switch in the stack can be members of the VLAN; follow this procedure to add ports from each switch, one switch at a time.

## Edit/Delete a Port-based VLAN

Edit/Delete a Port-based VLAN		
Edit/Delete a VLAN	ULAN Name	Ports
Action: <Edit >	DEFAULT_VLAN	10
	ENGR_VLAN	5
	MRKT_VLAN	8
	MFG_VLAN	4
After choosing an action, select a VLAN from the list at the right and press Enter.		
Choose to edit or delete a VLAN.		
Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh		

### LOCATION

Main Menu

Configure VLAN

Edit/Delete a Port-based..

Edit VLAN

### Description

**Action:** Delete a VLAN or change its port membership. Press the **[Spacebar]** to toggle Edit or Delete and then use the **[Tab ↴]** or **[→]** keys to select a VLAN and press **[Enter]**. The DEFAULT\_VLAN cannot be deleted from the switch.

**VLAN Name:** The names of existing port-based VLANs.

**Ports:** Total number of member ports in the specified VLAN.

## Edit VLAN Membership (Port-based)

Edit VLAN Membership (Port-based)							
VLAN name: [ENGR_VLAN ]							
Select switch: < Control >							
Port	Member	Port	Member	Port	Member	Port	Member
=====	=====	=====	=====	=====	=====	=====	=====
1	<Yes>	7	<No >	13	<Yes>	19	<Yes>
2	<No >	8	<Yes>	14	-	20	<No >
3	<No >	9	<Yes>	15	-	21	<No >
4	<No >	10	<Yes>	16	-	22	<No >
5	<Yes>	11	<Yes>	17	-	MP1	<No >
6	<Yes>	12	N/A	18	<No >	MP2	<No >
APPLY							
Select 'Yes' or 'No' to add or remove each port from the VLAN.							
CTRL+T = Main Menu (Top)		Esc = Previous screen		CTRL+R = Refresh			

### LOCATION

Main Menu

Configure VLAN

Edit/Delete a Port-based...

### Description

This screen is very similar to the VLAN creation screen. You can change the membership status of ports within the VLAN but you cannot change the name of the VLAN.

**VLAN name:** The name of the VLAN you are editing.

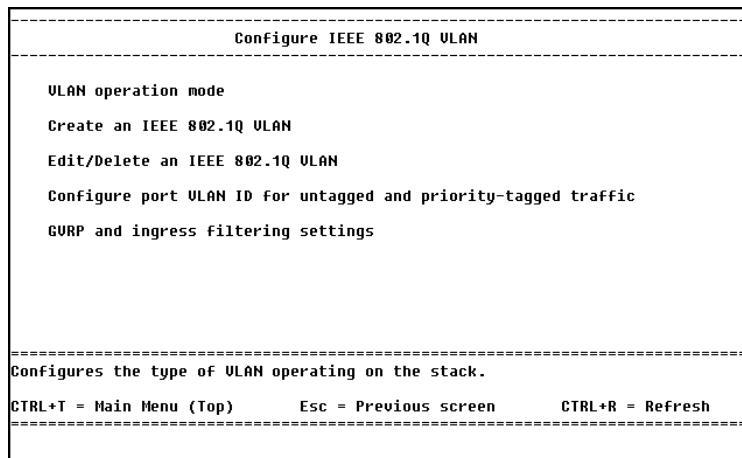
**Select switch:** Press the **[Spacebar]** to select a switch to configure.

**Member:** Determines which ports will participate in the current VLAN. Ports can be members of only one port-based VLAN. Press the **[Spacebar]** to toggle the field for the following options:

- **<Yes>**: The port will be a member of the VLAN.
- **<No >**: The port will not be a member of the VLAN.
- **-** : The port is part of an aggregated link.
- **N/A** : If this is displayed it means the port is already participating in another VLAN. Ports can belong to only one VLAN.

**APPLY:** Select this button and press **[Enter]** to activate the settings.

## Configure IEEE 802.1Q VLAN



### LOCATION

Main Menu  
Configure VLAN

### Description

**VLAN operation mode:** Changes the type of VLAN operating on the switch, or to disable VLANs entirely.

**Create an IEEE 802.1Q VLAN:** Creates a new 802.1Q VLAN and adds ports to the VLAN.

**Edit/Delete an IEEE 802.1Q VLAN:** Changes port membership of an existing VLAN, or you can remove a VLAN from the switch.

**Configure port VLAN ID (PVID) for untagged and priority-tagged traffic:** Assigns a VLAN to incoming packets without a VID.

**GVRP and ingress filtering settings:** Sets port-level options for dynamic VLAN creation and packet filtering by VLAN.

## Add an IEEE 802.1Q VLAN (Configure Port Membership)

Add an IEEE 802.1Q VLAN (Configure Port Membership)							
VLAN name: [ENGR_VLAN]		VLAN ID: [45]		Allow IGMP snooping: <Yes>			
Select switch: < Control >							
Port	Member	Port	Member	Port	Member	Port	Member
=====	=====	=====	=====	=====	=====	=====	=====
1	<Yes>+	7	<No >	13	<Yes>	19	<Yes>
2	<No >	8	<Yes>	14	-	20	<No >
3	<No >	9	<Yes>	15	-	21	<No >
4	<No >	10	<Yes>	16	-	22	<No >
5	<Yes>+	11	<Yes>	17	-	MP1	<No >
6	<Yes>	12	<No >	18	<No >	MP2	<No >
NEXT --->							
Select 'Yes' or 'No' to add or remove each port from the VLAN.							
CTRL+T = Main Menu (Top)		Esc = Previous screen				CTRL+R = Refresh	

### LOCATION

Main Menu  
Configure VLAN  
Create an 802.1Q VLAN

### NOTE

Devices on the network must have the same VID as the VLAN to be on the VLAN and be able to communicate.

### NOTE

A '+' next to the Member toggle indicates that the port is a member of more than one VLAN.

### Description

**VLAN name:** This field allows you to assign a name to the VLAN. The name can consist of any character (no spaces) and be up to 12 characters long. Once a VLAN is created the name cannot be changed.

**VLAN ID:** Assign a unique ID number to the VLAN. This number will be used to identify all packets belonging to that VLAN. Type in a number from 2 to 4094. The DEFAULT\_VLAN (created when you select a VLAN operation mode) is assigned a VID of 1.

**Allow IGMP snooping:** Press the **[Spacebar]** to determine if the switch will perform IGMP snooping on this VLAN. There are a maximum of 24 IGMP snooping sessions allowed.

**Select switch:** Press the **[Spacebar]** to select a switch to configure.

**Member:** Identifies which ports will participate in the VLAN being created. Press the **[Spacebar]** to toggle the field for the following options:

- <Yes>: The port is a member of the VLAN
- <No >: The port is not a member of the VLAN.
- - : The port is part of an aggregated link.

**NEXT:** Select this button and press **[Enter]** to access the Add an IEEE 802.1Q VLAN (Configure Port Tagging) screen.

## Add an IEEE 802.1Q VLAN (Configure Port Tagging)

Add an IEEE 802.1Q VLAN (Configure Port Tagging)							
VLAN name: ENGR_VLAN      VLAN ID: 1234							
Select switch: <Control>							
Port	Action	Port	Action	Port	Action	Port	Action
=====	=====	=====	=====	=====	=====	=====	=====
1	<Tag>	7	-	13	<Tag>	19	<Tag>
2	-	8	<Untag>	14	-	20	<Tag>
3	-	9	<Tag>	15	-	21	<Tag>
4	-	10	<Tag>	16	-	22	<Tag>
5	<Tag>	11	<Untag>	17	-	MP1	<Tag>
6	<Tag>	12	-	18	-	MP2	<Tag>
<--- PREV    APPLY							
Select 'Tag' to tag traffic for this VLAN. Otherwise, select 'Untag'.							
CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh							

### LOCATION

Main Menu

Configure VLAN

Create an 802.1Q VLAN

Add an 802.1Q VLAN...

### Description

**VLAN name:** Displays the VLAN name assigned on the Add an IEEE 802.1Q VLAN (Configure Port Membership) screen.

**VLAN ID:** Displays the VLAN ID assigned on the Add an IEEE 802.1Q VLAN (Configure Port Membership) screen.

**Select switch:** Displays the switch that is being configured.

**Action:** Indicates whether the device connected to this port supports tagging (press Spacebar).

**PREV:** Returns to the Add an IEEE 802.1Q VLAN (Configure Port Membership) screen.

**APPLY:** Returns to the Configure IEEE 802.1Q VLANs screen.

**NOTE**

Determine which devices on your network support tag-based VLANs and which do not, before you start this procedure.

## How to Configure 802.1Q VLAN

Setting up a 802.1Q VLAN is a two-step process. The first step is to create a VLAN on the switch and assign member ports. The second step requires you to make sure that tagging is set up properly for your attached devices. For devices that don't support tagging an extra configuration step is required.

### Step 1: Create an 802.1Q VLAN and add ports

- 1 From the Main Menu, select Configure VLAN.

Note: Make sure the switch's current VLAN operation mode is set to IEEE 802.1Q VLAN. Refer to "Configure VLAN Operation Mode" in Chapter 5 to change the VLAN operation mode.

- 2 Select Create an IEEE 802.1Q VLAN and press **[← Enter]**.
- 3 Type a name for the new VLAN (no spaces) and press **[← Enter]**.
- 4 Type a VLAN ID and press **[← Enter]**. The ID number can be any number from 2 to 4094.
- 5 Determine if you want to allow IGMP Snooping on this VLAN. This is important since the switch can support more 802.1Q VLANs than the maximum of 24 IGMP snooping sessions available.
- 6 Press the **[Spacebar]** to display the switch you want to configure.
- 7 Select ports to add to the VLAN. Use **[Spacebar]** to toggle the Member field to Yes.
- 8 Select the NEXT button and press **[← Enter]**.

### Step 2: Configure tagging for member ports

If the device on a particular port does not support tags, configure that port as untagged. This ensures that the switch removes tags from packets before they leave the switch for the device. If you configure a port as untagged, proceed to step 3 (Configure VLAN for untagged devices) when you are finished with step 2.

- 1 Press **[Spacebar]** to select Tag or Untag for each port that is a member of the VLAN.
- 2 Select the APPLY button and press **[← Enter]**.

If you configured any of the ports in the VLAN as Untagged, proceed to step 3 to configure ports for untagged devices and associate those ports with a PVID (port VLAN ID).

## Step 3: Configure VLAN for untagged devices

Even if the device attached to the switch doesn't support 802.1Q tags it is still possible for the device to participate in the VLAN. When communicating with untagged devices the switch performs two functions:

**First, the switch determines how to forward untagged traffic.** For untagged traffic, the switch assigns a default VID to the incoming traffic from the untagged device. Normally, all untagged traffic received on the switch is assigned a VLAN ID=1 or the DEFAULT\_VLAN. You can change this PVID to the VID of the VLAN you want the port to use.

**Next, the switch strips 802.1Q tags before sending traffic to the untagged device.** When the switch needs to send traffic from a port to an untagged device, it strips the 802.1Q tag, otherwise the untagged device may not understand how to process the VID tag.

Use the following steps to add an untagged device to an 802.1Q VLAN.

- 1 Ensure that the port is a member of the VLAN. Refer to the procedure in step 1 (previous page) to add a port to an 802.1Q VLAN.
- 2 From the Configure VLAN menu, select Configure VLAN ID for untagged and priority-tagged traffic and press **[← Enter]**.
- 3 Press the **[Spacebar]** to display the switch you want to configure.
- 4 Select the port where the untagged device is connected. For example, port 7.
- 5 Type the VID of the VLAN you want the port to belong to and press **[← Enter]**. This is the same ID number you entered in step 1.

By specifying a VID you set the switch to assign a particular VID to any incoming traffic it receives on that port.

## Edit/Delete an IEEE 802.1Q VLAN

Edit/Delete an IEEE 802.1Q VLAN		
Select an Action	VLAN Name	VLAN ID
Action: <Edit >	DEFAULT_VLAN	1
	ENGR_VLAN	5
	MRKT_VLAN	10
	MFG_VLAN	15
	CUST_SUPPORT	20

After choosing an action, select a VLAN from the list at the right and press Enter.

Choose to edit or delete a VLAN.

Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh

### LOCATION

Main Menu  
 Configure VLAN  
 Edit/Delete an 802.1Q...

### Description

Use this screen to select a VLAN to edit the port membership in the VLAN or delete the VLAN entirely from the switch.

**Action:** Press the **Spacebar** to toggle between <Edit> and <Delete>, then select a VLAN from the list and press **Enter**.

**VLAN name:** The name of the VLAN you are configuring.

**VLAN ID:** A unique number assigned to identify an 802.1Q VLAN.

## Edit an IEEE 802.1Q VLAN (Configure Port Membership)

Edit an IEEE 802.1Q VLAN (Configure Port Membership)							
VLAN name: [ENGR_VLAN]		VLAN ID: [1234]	Allow IGMP snooping: <Yes>				
Select switch: < Control >							
Port	Member	Port	Member	Port	Member	Port	Member
=====	=====	=====	=====	=====	=====	=====	=====
1	<Yes>+	7	<No>	13	<Yes>	19	<Yes>
2	<No>	8	<Yes>	14	-	20	<No>
3	<No>	9	<Yes>	15	-	21	<No>
4	<No>	10	<Yes>	16	-	22	<No>
5	<Yes>+	11	<Yes>	17	-	MP1	<No>
6	<Yes>	12	<No>	18	<No>	MP2	<No>
NEXT --->							
Select 'Yes' or 'No' to add or remove each port from the VLAN.							
CTRL+T = Main Menu (Top)		Esc = Previous screen			CTRL+R = Refresh		

### LOCATION

Main Menu  
 Configure VLAN  
 Edit IEEE 802.1Q VLAN

### Description

**VLAN name:** Name of the VLAN you are editing or deleting.

**VLAN ID:** Assigns a unique ID number to the VLAN. This number will be used to identify all packets belonging to that VLAN. Type in a number from 2 to 4094.

**Allow IGMP snooping:** Press the **[Spacebar]** to determine if the switch will perform IGMP snooping on this VLAN. There are a maximum of 24 IGMP snooping sessions allowed.

**Select switch:** Press the **[Spacebar]** to select a switch to configure.

**Member:** Determines which ports are part of the VLAN being created. Press the **[Spacebar]** to toggle the field for the following options:

- **<Yes>:** The port will be a member of the VLAN.
- **<No>:** The port will not be a member of the VLAN.
- **- :** The port is part of an aggregated link.

**NEXT:** Select this button and press **[Enter]** to access the Edit an IEEE 802.1Q VLAN (Configure Port Tagging) screen.

### NOTE

A '+' next to the Member toggle indicates that the port is a member of more than one VLAN.

## Edit an IEEE 802.1Q VLAN (Configure Port Tagging)

Edit an IEEE 802.1Q VLAN (Configure Port Tagging)							
VLAN name: ENGR_VLAN				VLAN ID: 1234			
Select switch: <Control >							
Port	Action	Port	Action	Port	Action	Port	Action
1	<Tag >	7	-	13	<Tag >	19	<Tag >
2	-	8	<Untag>	14	-	20	<Tag >
3	-	9	<Tag >	15	-	21	<Tag >
4	-	10	<Tag >	16	-	22	<Tag >
5	<Tag >	11	<Untag>	17	-	23	<Tag >
6	<Tag >	12	-	18	-	24	<Tag >
				<--- PREV    APPLY			
Select 'Tag' to tag traffic for this VLAN. Otherwise, select 'Untag'.							
CTRL+T = Main Menu (Top)				Esc = Previous screen		CTRL+R = Refresh	

### Description

This screen allows the switch to manage outgoing packets that do not contain IEEE 802.1Q VLAN tags.

**VLAN name:** Displays the name of the VLAN you are editing or deleting.

**VLAN ID:** Displays the ID number of the VLAN. This number identifies all packets belonging to that VLAN.

**Select switch:** Press the **[Spacebar]** to select a switch to configure.

**Action:** Determines whether outgoing traffic from that port is untagged by the switch.

**PREV:** Returns you to the Edit an IEEE 802.1Q VLAN screen.

**APPLY:** Returns you to the Configure VLAN (IEEE 802.1Q) screen.

## Configure VLAN ID for Untagged Traffic

Configure Port VLAN ID For Untagged and Priority-tagged Traffic							
Select switch: < Control >							
Port	PVID	Port	PVID	Port	PVID	Port	PVID
1	[ 1 ]	7A	[ 1 ]	13	[ 1 ]	19	[ 1 ]
2	[ 15 ]	8	-	14	[ 1 ]	20	[ 1 ]
3	[ 150 ]	9	-	15	[ 1 ]	21	[ 1 ]
4	[ 1500 ]	10	-	16	[ 1 ]	22	[ 1 ]
5	[ 1 ]	11	-	17	[ 1 ]	MP1	[ 1 ]
6	[ 1 ]	12	[ 1 ]	18	[ 1 ]	MP2	[ 1 ]

Assign a port VLAN ID (PVID) from 1-4094. Changes are applied immediately.

CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh

### LOCATION

Main Menu  
 Configure VLAN  
 Configure Port VLAN ID...

### NOTE

If ports are aggregated, the letter A appears next to the anchor port, and the member ports do not display any data.

### Description

This screen helps the switch manage incoming packets that do not contain IEEE 802.1Q VLAN tags or priority-tagged traffic (packets with a VID of zero). This is an ingress rule only; it does not apply to outbound traffic.

Untagged traffic is normally assigned to VLAN 1 (the DEFAULT\_VLAN), which includes all ports on the switch. However, if you don't want to send untagged traffic on a specific port to the default VLAN, you can assign a different PVID.

For example, if you set a port's PVID to 5, all untagged traffic on the port will be assigned to VID 5—even if the port does not belong to that VLAN.

**PVID:** Type the VID of the existing 802.1Q VLAN where you want to send untagged traffic.

**APPLY:** Select this button and press **Enter** to apply changes on this page.

## GVRP and Ingress Filtering Settings

GVRP and Ingress Filtering Settings		
Select switch: < Control >		Configure ports: < 1 to 12 >
Port	GVRP	Ingress Filtering
1	<Disabled>	<Disabled>
2	<Disabled>	<Disabled>
3	<Disabled>	<Enabled >
4	<Enabled >	<Enabled >
5	<Disabled>	<Disabled>
6	<Disabled>	<Disabled>
7	<Disabled>	<Disabled>
8	<Disabled>	<Disabled>
9A	<Enabled >	<Enabled >
10	-	-
11	-	-
12	-	-

Configures the switch to allow dynamic VLAN configuration on this port.

CTRL+T = Main Menu (Top)    Esc = Previous screen    CTRL+R = Refresh

### LOCATION

Main Menu

Configure VLAN

GVRP and Ingress...

### NOTE

In order for GVRP to work, the port must be connected to another switch that supports GVRP.

### Description

**Select switch:** Use the **[Spacebar]** to select a switch to configure.

**Configure ports:** Use the **[Spacebar]** to toggle the range of ports that you can configure.

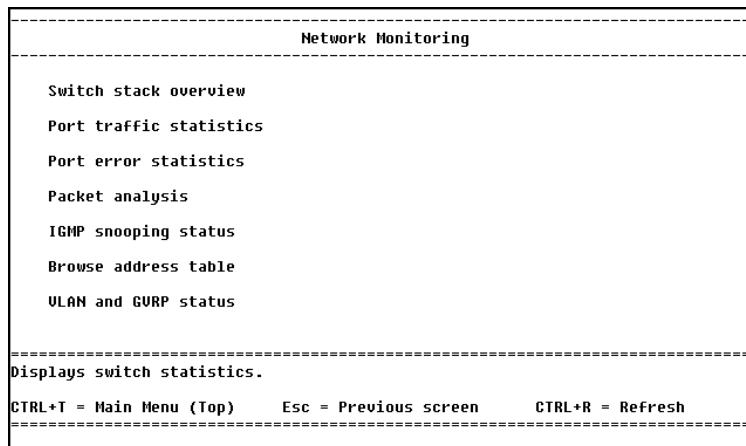
**GVRP:** Allows the switch to create VLANs dynamically. Use the **[Spacebar]** to toggle the action for each port. Options are:

- **<Enabled>:** The switch monitors traffic on this port for GVRP requests from network nodes. If a GVRP-enabled device sends a request to this port, the switch creates a VLAN dynamically and adds the requesting device to the new VLAN. This is the default setting.
- **<Disabled>:** The switch ignores GVRP requests in incoming packets on this port.

**Ingress Filtering:** Lets the switch filter incoming packets based on VLAN membership. Use the **[Spacebar]** to toggle the action for each port. Options are:

- **<Enabled>:** Incoming packets belonging to a specific VLAN are forwarded only if the port belongs to that VLAN. This is the default setting.
- **<Disabled>:** All packets coming into the port will be forwarded, regardless of the port's VLAN membership.

## Monitoring (Network Statistics)



### LOCATION

Main Menu  
Monitoring

### Description

**Switch stack overview:** An overview of all ports on the switch.

**Port traffic statistics:** Port traffic statistics and utilization.

**Port error statistics:** Port error statistics.

**Packet analysis:** Traffic per port by packet size and type.

**IGMP snooping status:** The active IP multicast groups detected by the switch.

**Browse address table:** The entries in the switch's address table by port or MAC address.

**VLAN and GVRP status:** The status for static and dynamic tag-based (IEEE 802.1Q) VLANs. This option is available only when the switch is running 802.1Q VLANs.

## Switch Stack Overview

Switch Overview							
Switch: < Control >				Update interval:<1 min>			
Port	Tx/sec	Rx/sec	% Util.	Port	Tx/sec	Rx/sec	% Util.
1	2154	21546	12	12	5318	5601	2
2	87654	4657878	23	13	0	0	0
3	79456321	397943215	34	14	0	0	0
4	0	0	0	15	0	0	0
5	0	0	0	16	14590	3657	10
6	0	0	0	17	7345	454687	1234
7	78761	12457	15	18	1256	3589	9
8	24685	7456	5	19	0	0	0
9	8798165	2478975	22	20	0	0	0
10	0	0	0	21	0	0	0
11	0	0	0	22	69855321	8965323	45
Module A							
1	698523	245687	25	2	3698	1589	5
Sets the polling interval.							
CTRL+T = Main Menu (Top)				Esc = Previous screen		CTRL+R = Refresh	

### LOCATION

Main Menu  
Monitoring  
Switch Stack Overview

### Description

This screen provides a quick overview of activity on the stack. The information is displayed per switch. The screen displays the traffic sent and received for each port on the switch, including any optional modules, and the percent utilization for that port.

**Switch:** Press the **[Spacebar]** to select a switch to view.

**Update interval:** Press the **[Spacebar]** to select the time period between updates. For example, an Update interval of 5 sec means Local Management collects and displays information from the switch every five seconds.

**Tx/sec or Rx/sec:** The current rate of good frames that were transmitted or received by the port.

**% Utilization:** The percentage of Ethernet bandwidth (10Mbps, 100Mbps, or 1000Mbps) used by the device attached to that port.

## Port Traffic Statistics

Port Traffic Statistics				
Switch: < Control >	Select port: <1-4>	Update interval: <2 sec >		
Port	1	2	3	4
Speed/Duplex	10Mbps/Half	100Mbps/Half	10Mbps/Full	100Mbps/Half
% Utilization	8	15	3	6
Bytes received	169608	501057	1397353	490297
Bytes sent	1150987	20882516	65497213	20884076
Frames received	2772	14479	43765	14473
Frames sent	2111	7264	21711	7171
Total bytes recv.	169608	501057	1397378	490297
Total frames recv.	2215	7264	21989	7171
Last seen MAC	00A0C9A3727B	00A0C96804E5	00A0C96814CB	00A0C9681481

=====  
Selects a group of ports to display traffic statistics.  
=====

CTRL+T = Main Menu Esc = Previous screen C = Clear counters CTRL+R = Refresh

### LOCATION

Main Menu  
 Monitoring  
 Port Traffic Statistics

### Description

**Switch:** Press the **[Spacebar]** to select a switch to view.

**Select port:** Selects the range of ports to view. Statistics are displayed four ports at a time. Press the **[Spacebar]** to toggle between port numbers and the optional module. The example shows ports 1-4 on a 24-port switch.

**Update interval:** Press the **[Spacebar]** to select the time period between updates. For example, an Update interval of 5 sec means Local Management collects and displays information from the switch every five seconds.

**Speed/Duplex:** The current connection status of the port.

**% Utilization:** The percentage of Ethernet bandwidth (10Mbps, 100Mbps, or 1000Mbps) used by the device attached to that port.

**Bytes received:** The number of bytes (octets) contained in error-free frames. This includes octets in unicast, broadcast, or multicast frames and packets whose destination address is mapped to the receiving port. It also includes octets in packets dropped because of full buffers, spanning tree, disabled ports, no link, or empty distribution list.

**Bytes sent:** The number of error-free bytes (octets) sent over this port.

**Frames received:** The number of frames detected without errors. Includes unicast, broadcast, or multicast frames and frames whose destination address is mapped to the receiving port. It also includes frames dropped because of full buffers, spanning tree, disabled ports, no link, or empty distribution list.

**Frames sent:** The number of frames sent over this port without errors.

**Total bytes recv. (received):** The number of bytes (octets) contained in all frames received by this port. This counter reflects all bytes received on the port. This includes bytes contained in frames that contain errors, dropped frames, frames whose destination address is mapped to the receiving port, and frames that were not forwarded through the switch.

**Total frames recv. (received):** This counter reflects all frames received on the port. This includes frames that contain errors, dropped frames, frames whose destination address is mapped to the receiving port, and frames that were not forwarded through the switch.

**Last Seen MAC:** Displays the MAC address of the last device that sent packets over this port. For a MAC address to appear in this field, the device must have sent at least one packet to the switch.

## Port Error Statistics

Port Error Statistics					
Switch: < Control >	Select port: < 1-4 >	Update interval:<1 min >			
Port	1	2	3	4	
Speed/Duplex	10Mbps/Half	10Mbps/Full	-	-	
CRC error	32	0	0	0	
Oversize frames	5	12	0	0	
Fragments	128	8	0	0	
Jabber	0	0	0	0	
Late collision	0	0	0	0	
MAC Rx error	0	0	0	0	
Dropped frames	18	3	0	0	
Undersize frames	7	2	0	0	
Total errors	174	25	0	0	
Collisions	25	128	0	0	

Selects a group of ports to display statistics.

CTRL+T = Main Menu Esc = Previous screen C = Clear counters CTRL+R = Refresh

### LOCATION

Main Menu  
Monitoring  
Port Error Statistics

### Description

**Switch:** Press the [Spacebar] to select a switch to view.

**Select port:** The range of ports to view. Statistics are displayed four ports at a time. Press the [Spacebar] to toggle between port numbers and the optional module. The example shows ports 1-4 on a 24-port switch.

**Update interval:** Press the [Spacebar] to select the time period between updates. For example, an Update interval of 5 sec means Local Management collects and displays information from the switch every five seconds.

**Speed/Duplex:** The current connection status of the port.

**CRC error:** The number of valid length frames that had a bad Frame Check Sequence (FCS).

**Oversize frames:** The number of frames exceeding the maximum allowed frame size but are otherwise valid Ethernet frames (good CRC).

**Fragments:** The number of frames that are less than 64 bytes; this number includes frames without a start-of-frame delimiter. A fragmented frame also has an invalid CRC.

**Jabber:** Indicates that a device (such as a faulty NIC) on the network is sending improper electrical signals. Because Ethernet uses electrical signaling to determine whether it can transmit, a jabber condition can halt all traffic on a segment.

**Late collision:** The number of collisions detected after the allowable detection period. This usually occurs in networks where cables are longer than the IEEE specification.

**MAC Rx error:** The number of received packets containing Rx Error events.

**Dropped frames:** The number of frames dropped by this port since the last switch reboot.

**Undersize frames:** The number of frames detected that are less than the minimum permitted frame size of 64 bytes and have a good CRC. Undersize frames usually indicate collision fragments, a normal network event.

**Total errors:** The total number of errors detected since the last switch reboot. Total errors include everything listed in this error table.

**Collisions:** A collision occurs when two devices try to transmit at the same time. This counter tracks the number of times packets have collided on this port. Collisions are normal in an Ethernet network and tend to increase as network utilization rises. Therefore, an increase in collision rate without an increase in network utilization might indicate a problem.

## Packet Analysis

Packet Analysis					
Switch: < Control >		Select port: < 1 >	Update interval:<1 min >		
Length	Frames	Frames/sec		Frames	Frames/sec
64	128133	22456			
65-127	180768	5464888			Unicast Packets
128-255	134805	23449		RX   17560	29
256-511	457162	235678		TX   14330	6
512-1023	3003	13598984			Multicast Packets
1024-Max	567	2135		RX   139401	23
				TX   0	0
					Broadcast Packets
				RX   706034	3
				TX   26987	0
=====					
Selects a port for which to display statistics.					
CTRL+T = Main Menu Esc = Previous screen C = Clear counters CTRL+R = Refresh					
=====					

### LOCATION

Main Menu  
Monitoring  
Packet Analysis

### Description

This screen displays a breakdown of the traffic received on a port by size and type of frame.

**Switch:** Press the **[Spacebar]** to select a switch to view.

**Select port:** Selects the port to view. Statistics are displayed one at a time. Press the **[Spacebar]** to toggle between the ports and the optional module.

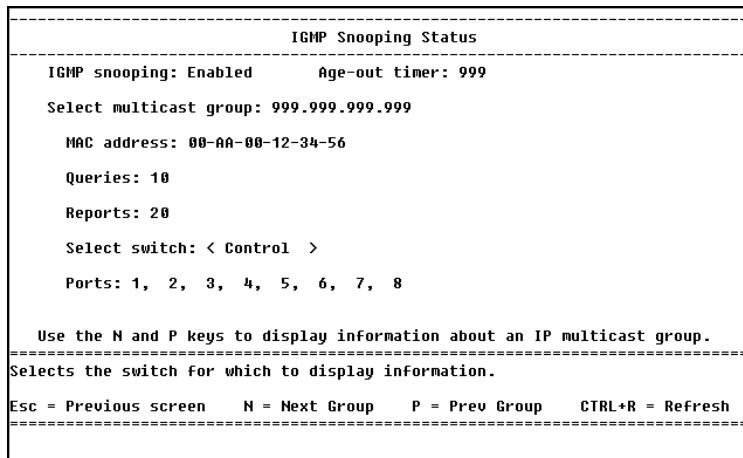
**Update interval:** Press the **[Spacebar]** to select the time period between updates. For example, an update interval of 5 sec means the switch collects and displays information every five seconds.

**Length:** Indicates the number of frames received of different lengths. This also includes dropped frames and frames whose destination address is mapped to the receiving port. It does not include frames that contain errors.

### Frames

- **Unicast:** The number of good unicast frames received and transmitted on this port. Unicast frames are sent from one network node to another network node.
- **Multicast:** The number of good multicast frames received and transmitted on this port. Multicast frames are sent from one node to multiple nodes on the segment.
- **Broadcast:** The number of good broadcast frames received and transmitted on this port. Broadcast frames are sent from one network node to all nodes on a segment.

## IGMP Snooping Status



### LOCATION

Main Menu  
Monitoring  
IGMP Snooping Status

### Description

This screen displays the active multicast groups detected by the switch. The switch uses these groups for filtering purposes when you enable IGMP snooping.

**VLAN:** Displays the name of the VLAN with IGMP snooping enabled. This field only appears when port-based or tag-based VLANs are active on the switch.

**IGMP snooping:** The snooping status (enabled or disabled).

**Age-out timer:** The time the switch waits between IGMP queries.

**Select multicast group:** The IP address of the multicast group.

**MAC address:** The MAC address of the multicast group.

**Queries:** The number of IGMP requests sent from the IGMP multicast server or router to individual network hosts.

**Reports:** The number of notifications sent from each host to the server, signifying that the host is still (or wants to be) part of the multicast group.

**Select switch:** Press the **[Spacebar]** to select a switch to view.

**Ports:** The ports on the switch that have devices belonging to the selected multicast group.

Use the **N** (next group) and **P** (previous group) keys to display the status of different IP multicast groups on the switch.

## Browse Address Table

Browse Address Table							
Filter: <Switch/Port>		Switch: < Control >		Port number: < 2 >			
Total addresses in table: 10829 DISPLAY							
Sw/Port	MAC Address	Learn	Sw/Port	MAC Address	Learn		
1/2	0002B3002140	Dynamic	1/2	0090271EFD90	Dynamic		
1/2	0002B3002162	Dynamic	1/2	00902731C2B0	Dynamic		
1/2	0002B3002A7E	Dynamic	1/2	00902731C2B3	Dynamic		
1/2	0004AC661DC5	Dynamic	1/2	0090273925A6	Dynamic		
1/2	0004AC661DF2	Dynamic	1/2	009027394026	Dynamic		
1/2	001011477FFB	Dynamic	1/2	0090273E1140	Static		
1/2	0030B6309043	Dynamic	1/2	0090273E1148	Static		
1/2	0060F32088D4	Dynamic	1/2	0090273E2907	Static		
1/2	0090270413AE	Dynamic	1/2	0090273E4B95	Dynamic		
1/2	00902704141B	Dynamic	1/2	009027460BD5	Dynamic		
1/2	0090270622C0	Dynamic	1/2	00902757D731	Dynamic		
- More -							
Specify to search table by MAC address or switch.							
Esc = Previous screen    N = Next Page    P = Prev Page    CTRL+R = Refresh							

### LOCATION

Main Menu  
Monitoring  
Browse Address Table

### Description

This screen allows you to sort through the switch's MAC address table and view the addresses the switch has recorded. The switch uses this table forwarding traffic so it doesn't broadcast traffic over every port. You can choose to search this table by MAC address or port.

**VLAN (port-based)/VLAN ID (tag-based):** When the switch is running port-based or tag-based VLANs, the address table associates MAC addresses with specific VLANs. Use the **[Spacebar]** to select a VLAN.

**Filter:** Press the **[Spacebar]** to select how to view the address table. You can sort this table by <MAC address> or by <Switch/Port>.

**Enter MAC address:** Use this field to search for a specific MAC address in the switch's table.

**Switch:** Press the **[Spacebar]** to select a switch to view.

**Port number:** Use the **[Spacebar]** to select a port. This displays the MAC addresses seen on the specified port. This search is useful for monitoring which ports a device is using, or which devices are using one port.

**Total addresses in table:** The total number of addresses recorded by the switch. This number includes addresses that have been entered manually into the switch through the Static MAC Addresses screen.

**DISPLAY:** After you have entered in a MAC address, or chosen a port, select this button and press **Enter** to display the results.

**Learn:** This displays how the switch recorded the particular MAC address. Dynamic means the switch recorded the address by sending out a query. Static means the address was entered manually through the Static MAC Addresses screen.

## VLAN and GVRP Status

```

VLAN and GVRP Status

IEEE 802.1Q VLAN ID: <0018>
GARP status: Enabled           Number of IEEE 802.1Q VLANs: 106
Status: Dynamic (GVRP)
Creation time since switch power up: 00:00:00
Select switch: < Control >
Current egress ports: 1, 2, 3, 4, 5, 6, 7, 8
Current untagged ports: 9, 10, 11, 12, 13, 14, 15

=====
Selects the next VLAN.
Esc = Previous screen  CTRL+R = Refresh   N = Next page   P = Previous Page
=====
```

### LOCATION

Main Menu  
 Monitoring  
 VLAN and GVRP Status

### Description

This screen is available only if the switch is running tag-based (IEEE 802.1Q) VLANs. The screen shows information about one VLAN at a time. Press N or P to view status information for other tag-based VLANs on the switch.

**IEEE 802.1Q VLAN ID:** VLAN ID of the selected tag-based VLAN.

**GARP status:** Whether the VLAN can process GVRP requests.

**Number of IEEE 802.1Q VLANs:** Total number of tag-based VLANs (both static and dynamically created) currently configured on the switch.

**Status:** Whether the VLAN is permanent or dynamic. A permanent (static) tag-based VLAN is created and configured by the switch administrator. A dynamic VLAN is created by the switch in response to GVRP requests from GVRP-enabled network nodes.

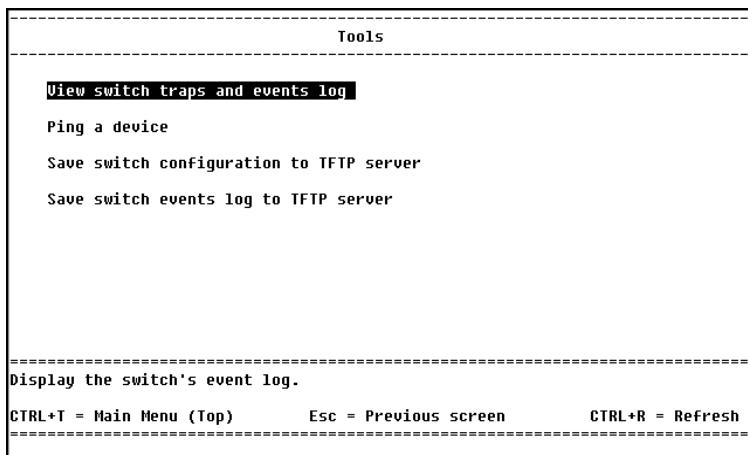
**Creation time since switch power up:** The amount of time since the switch was rebooted that the VLAN has been active.

**Select switch:** Press the **Spacebar** to select a switch.

**Current egress ports:** Lists all ports that belong to the specified tag-based VLAN.

**Current untagged ports:** Lists all ports that are configured to strip 802.1Q VLAN information from packets leaving the switch.

## Tools



### LOCATION

Main Menu  
Tools

### Description

**View switch traps and events log:** Events contained in the switch's internal log.

**Ping a device:** Pings another device on the network to test connectivity.

**Save switch configuration to a TFTP server:** Backs up the switch's current settings to a TFTP server.

**Save switch events log to a TFTP server:** Backs up the switch's events log to a TFTP server.

## Switch Event Log

Switch Event Log		
Seq.#	Time	Description
067	010d22h31m	STP status: Topology change.
066	009d12h18m	STP status: This switch became the new root of tree.
065	009d08h52m	Port 15 Link Up
064	008d01h35m	Port 16 is experiencing a broadcast storm!
063	007d00h13m	Port 12 is auto-partitioned.
062	007d04h12m	Operator logged out.
061	007d06h10m	Operation logged in with Administrator privilege.
060	007d10h09m	Successful login through telnet.
059	006d21h00m	Port 5 has lost link.
058	006d06h00m	Port 1 has changed speed to 100Mbps.
057	005d09h00m	Switch and Firmware OS is Fully operational.
056	005d02h00m	Power up. Express 530T Firmware OS loaded.
 - MORE - (12 of 154)		
Use the N, P, B, and E keys to view the log.		
N = Next Page    P = Prev Page    B = Log Begin    E = Log End    C = Clear Log		

### LOCATION

Main Menu  
 Tools  
 View Switch Traps and...

### Description

This screen allows you to view and navigate the switch's log. The log is similar to a trap and event receiver but it only captures traps/events generated by the switch itself. For example, the log includes events such as when a port is disabled, when an unauthorized user attempts to access a management interface, and when the switch reboots.

The log entries are listed chronologically from the last time the switch was rebooted. Use the following keys to navigate the log:

N = Next page

P = Previous page

B = Beginning of the log

E = End of the log

C = Clear the log

## Ping a Device

```
Ping a Device

Target IP address: [999.999.999.999]
Repetitions: [999]
Timeout (sec): [999]
PING DEVICE (press any key to stop)

Result
=====
999.999.999 is alive, time = 999 ms.

=====
Enter the IP address of the device or station to ping.
CTRL+T = Main Menu (Top)      Esc = Previous screen      CTRL+R = Refresh
```

### LOCATION

Main Menu  
Tools  
Ping a Device

### Description

**Target IP address:** Type the IP address of the device you want the switch to ping.

**Repetitions:** Type the number of times (1–255) you want the switch to send a ping to the specified device.

**Timeout:** Type the number of seconds (0–999) the switch waits before retrying a ping if it doesn't receive a response from the first ping.

**PING DEVICE:** Select and press the **Enter** key to start pinging a device. To stop a ping, press any key on the keyboard.

**Result:** Displays the target device's response to the ping.

## Upload Configuration Image File

Save Switch Configuration to TFTP Server

Server IP address: [134.134.155.132]

Save Configuration to (filename):[ ]

START

Result

=====  
=====  
IP address of the computer where the configuration is saved.  
=====  
=====  
Ctrl+T=Main Screen (Top)      Esc = Previous screen      CTRL+R = Refresh  
=====

### LOCATION

Main Menu  
Tools  
Upload Configuration File

### Description

This screen allows you to save an image of the switch's configuration to a file and upload it to a TFTP server.

**Server IP address:** The IP address of your TFTP server.

**Save configuration to (filename):** A file name and location to save the file on the server.

**START:** Select this button and press **Enter** to back up the switch settings.

### NOTE

This feature creates an image of the switch configuration and saves it in binary format. This is not the same as a .cfg file, which is saved in ASCII text (see Appendix for information about configuration files).

## Save Switch Events Log

Save Switch Events Log to TFTP Server

---

Server IP address: [124.123.123.80 ]

Save events logs to (filename):[ ]

START

Result

---

---

Type the IP address of the server to which you want to save the file.

Esc = Previous screen      N = Next Page      P = Prev Page      CTRL+R = Refresh

---

### LOCATION

Main Menu  
Tools  
Save Switch Events Log...

### Description

This screen allows you to save a list of the last 300 events to a file and upload it to a TFTP server.

**Server IP address:** Type the IP address of your TFTP server.

**Save events log to (filename):** Type a file name and location for where to save the file on the server.

**START:** Select this button and press **[Enter]** to save the events log.

# A

# Appendix: Technical Info

---

## About Configuration Files

A configuration file is an ASCII text file that contains initialization information and configuration settings for the switch specified by the network administrator. The switch's configuration file (.CFG) can be up to 10KB in size and is stored on a central server where it is downloaded into the hub using TFTP.

You can use a text editor, such as Microsoft Windows\* Notepad, to make changes to the configuration file. The switch interprets file lines beginning with the pound (#) sign as comments. It interprets all other lines as commands. When the switch initializes, it uses this file to configure parameters such as port speed, port security, and SNMP trap receivers.

Use of a standard configuration file can make managing multiple switches much simpler. Instead of requiring a network administrator to make changes to each manually, the switch uses the file to configure itself.

## Sample Configuration File

The following is an example of a configuration file. For a more detailed explanation and additional keyword support, please visit the Intel Customer Support Web site at <http://support.intel.com/support/express-switches>.

```
##### Intel Express 530T Switch Configuration File #####
#
# Lines beginning with a "#" character are comment lines.

##### IP Address Configuration #####
#
# Ip_addr= <ipaddress>           IP address used by the switch
# Subnet_mask= <ipaddress>        Specify default gateway
# Default_gateway= <ipaddress>    Specify subnet mask
#
#           Ip_addr= 124.123.122.121
#           Subnet_mask= 255.255.255.0
#           Default_gateway= 124.123.122.254

##### Console and Configuration File Information #####
#
# Specify the code type of the image file
#
# Code_type=PROM      Image type is PROM code
# Code_type=RUNTIME   Image type is runtime firmware
# Code_type=CONFIG    Image type is saved configuration file

          Code_type=PROM
#
# Image_file= <path>  Path and filename of runtime image or PROM image files
#
#           Image_file="e:\update\E530PROM.tfp"

##### Port Level Configuration #####
#
# Static_fdb_list={(MAC address, port #)}           MAC address and port# of static entries
# Port_nway_enabled_list={port#, port#, . . .}       Ports set to auto-negotiate
# Port_flow_ctrl_enabled_list={port#, port#, . . .}  Ports that have flow control enabled
# Port_backpressure_enabled_list={port#, port#, . . .} Ports that have back pressure set
# Port_priority_list= { H (high), L (low), . . . }    Sets 802.1p priority queues
# Port_stp_enabled_list={port#, port#, . . .}         Ports that are enabled
# Port_disabled_list={port#, port#, . . .}            Ports that are disabled

          Static_fdb_list={(0080c8001121, 1) (0080c8001122, 2) (0080c8001123, 3)}
          Port_nway_enabled_list={3,5,7}
          Port_flow_ctrl_enabled_list = {3,4,5,7}
          Port_backpressure_enabled_list = {16, 15, 14 }
          Port_priority_list = { H,L,A,L,H,A,L,H }
          Port_stp_enabled_list = {8,9,10,11, 20, 21,}
          Port_disabled_list = { 20,21,22}
```

```

##### Link Aggregation #####
#
# linkaggr_list={(index "name", width of the aggregated group, "state"
#                 index=from 1 to 4 (4=max number of aggregated groups possible)
#                 name=name of the aggregated group
#                 width=total port width of aggregated group
#                 state="enable" or "disable" (default=disable)
#
# linkaggr_list={(1 "Engineering Server", 2 "disable") (2 "Marketing Server", 3, "enable")
#                 (3 "3rd Floor Switch", 2, "enable)}

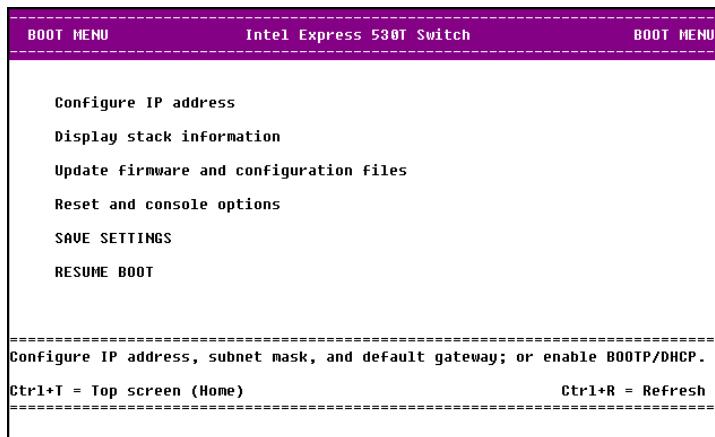
##### Configure PVID for Untagged Ports #####
#
# pvid_list={(port#, PVIDvalue) (port#, PVIDvalue) ...}
#           port#=port attached to device that does not support tags
#           PVIDvalue=VID of port to which you want untagged traffic routed
#
# pvid_list={(2, 100) (3, 100) (6, 15)}

##### Create 802.1Q VLAN on the Switch (Static Entries) #####
#
# 802_1q_static_list={(VID, "VLANstring", M/N U/T,...) (VID, "VLANstring", M/N U/T,...)}
#           M=member port (on ingress)
#           N=non member port (on ingress)
#           U=untagged device (on egress)
#           T=tagged device (on egress)
#           Either M or N can be specified for each port; not both
#           Either U or T can be specified for each port; not both
#
# 802_1q_static_list={(2, "VLAN2", MT, MU, MT, NT, MT, NU, NT, NU) (10, "VLAN10",
#                     MU, NT, NT, MT, MU, NT, MU)}
#                     MU, NT, NT, MT, MU, NT, MU)

##### GVRP (Dynamic VLAN Registration) #####
#
# gvrp_enabled={port#, port#, ...}
# gvrp_disabled={port#, port#, ...}
#           gvrp_enabled=VLAN dynamically registered with the switch
#           gvrp_disabled=VLAN not dynamically registered with the switch
#
# gvrp_enabled={1, 3, 5, 7}
# gvrp_disabled={2, 4, 6, 8}

```

## BOOT Menu



## Description

You usually don't need to use the BOOT Menu. The BOOT Menu is available only by connecting to the switch's serial port. It is used when the firmware fails to load.

To access the BOOT Menu, press **[Ctrl] + [C]** while the switch is starting up. The menu above displays. Most of the options available from the BOOT Menu are simplified versions of the normal runtime firmware; navigation is the same.

**Configure IP address:** Configures the switch's IP address.

**Display stack information:** Configures identification and displays hardware information about all switches in the stack.

**Update firmware and configuration files:** Configures the switch's internal software. Also used to specify the location of configuration files.

**Reset and console options:** Resets the switch to factory defaults to configure the port mode for the switch's serial port. Also sets the console timeout.

**SAVE SETTINGS:** Saves the changes to the switch's flash memory.

**RESUME BOOT:** Resumes the switch's boot process and loading of the firmware.

## List of Factory Defaults

- Software upgrade mode: Network
- Load configuration file: Disabled
- Console port data bits: 8
- IGMP snooping: Disabled
- Lock address table: Disabled
- System HOL-blocking state: Enabled
- System IGMP address: 192.0.2.1
- System default gateway: 0.0.0.0
- Port Nway state: Enabled (Auto-negotiate)
- Port backpressure state: Auto-negotiate
- Port HOL state: Enabled
- Ping repeat time: 1 time
- Port mirroring state: Disabled
- Port mirroring destination port: 2
- System bridge max age: 20 sec
- System bridge forward delay: 15 sec
- System aging time: 300 sec
- Per-port state: Enabled
- Read community string: Public
- Console user account: No username
- TFTP server address: 0.0.0.0
- Console baud rate: 9600
- Console port stop bit: 1
- System port partition state: Enabled
- MAC address Aging (sec): 300
- System console timeout: 15 minute
- System subnet mask: 255.255.255.0
- System BootP request: Enabled
- Port flow control state: Auto-negotiate IEEE 802.3x
- Port priority state: Use Frame Tag
- Ping IP address: 0.0.0.0
- Ping timeout: 5 sec
- Port mirroring source port: 1
- System spanning tree state: Disabled- IEEE 802.1d
- System bridge hello time: 2 sec
- System bridge priority: 32768
- Per-port spanning tree priority: 128
- Per-port spanning tree state: Enabled
- Write community string: Private
- Console user password: No password

## Optional module default settings

- FX Module Port Speed: 100Mbps
- FX Module Flow Control: IEEE 802.3x
- SX/LX Module Port Speed: 1000Mbps
- SX Module Flow Control: IEEE 802.3x
- FX Module Port Duplex: Full Duplex
- FX Module Priority: Use Frame Tag
- SX/LX Module Port Duplex: Full-Duplex
- SX Module Priority: Use Frame Tag

## Troubleshooting/FAQs

### I booted the switch, and the status LED stays orange, is something wrong?

By default, the switch is in BootP mode, and the LED stays orange while the switch waits for an IP address from the BootP server. In order to proceed with the boot, either bypass the BootP phase (refer to the Quick Start guide for instructions), or manually assign an IP address.

If the switch doesn't receive an IP address from the BootP server within ten minutes, it will continue the boot process as normal.

### How can I set the speed or duplex on individual ports?

Normally the switch handles all connections automatically but if you need to force speed or duplex, (for example, to accommodate older devices that don't support autonegotiation) use the Local Management or Web Device View.

### When I set the 530T to autonegotiate with flow control enabled and try to connect to another device, there is no link. Why?

Check the settings of the other device and disable flow control. If you want to use flow control on the port, force the speed, duplex, and flow control settings so that they match.

**I've connected the cable but the left LED (link) is off. Why?**

- Remove the cable and plug it in again. Wait up to six seconds for a link.
- Make sure you're using the correct type of cable (straight-through-MDI or crossover-MDI-X) for the device you want to connect to. If you're using the wrong cable, the link LED will not come on.
- Make sure the device you've connected to a port is a 10Base-T or 100Base-TX device. The 530T switch doesn't support 100Base-T4 devices running at 100Mbps. However, it does support T4 devices running at 10Mbps.
- Check the speed and duplex settings on the PC's network adapter.
- The cable is defective.

**The port's left LED (link) is on but I'm not seeing any activity when I try to ping a device on that port. Why?**

- The port could be disabled through management. Go into the Local Management or Web Device view to enable the port and try pinging the device again.
- The port could be partitioned (auto-disabled). This condition is usually caused by a malfunctioning network adapter or an over-loaded network segment. The switch will wait until it stops receiving collisions then clear the port automatically.

**After I connect to Local Management I see a blank screen. Why?**

- Make sure you are using a null modem cable (included).
- Check the settings in your terminal program. They should be set to 9600 baud, 8 data bits, No parity, 1 stop bit, and No flow control.
- Try pressing **Ctrl** + **Return** to force the screen to refresh.

**I keep getting an intermittent loss of link. (or data is not being transmitted) Why?**

- You may be using the wrong grade of cable. The wrong cable can cause erratic performance and you may eventually lose the connection between the port and the attached device.
- Check the duplex setting for the device connected to the port. You may have to use the Local Management or Web Device Manager to force the port to half or full duplex.
- A cable segment somewhere in your collision domain may be too long. Make sure none of your UTP cabling is longer than 100 meters.
- Check the Ethernet cable pairs. The TX pairs (pins 1 and 2) and the RX pairs (pins 3 and 6) should be twisted pairs. See diagram in Chapter 1.

**I created a tag-based VLAN, and I have tag-capable LAN adapters in my PCs, but I can still communicate with devices outside the VLAN. Why?**

Check to make sure that you have assigned a VID to the PC. If you don't assign a VID to the NIC in the PC it will behave as an untagged device. The default VID for untagged devices=1 so all untagged PCs will be a member of the DEFAULT\_VLAN.

**Can I stack 510, 520, or 550 switches with the 530T?**

No. The only switch that can be stacked with the 530T is the 535T. You can stack up to three 535T switches with a 530T.

## Locating MIB files

If you use a MIB browser, you can configure or view statistics for the switch. You can find these switch MIB files at the Intel Customer Support Web site at <http://support.intel.com/support/express/switches>.

- intel.mib
- int\_pbrd.mib
- int\_gen.mib
- int\_qprd.mib
- int\_2530.mib

When compiling the MIBs into an SNMP-compliant management application, compile the intel.mib first then compile the int\_gen.mib, int\_s530.mib, int\_pbrd.mib, and int\_qprb.mib files.

# Regulatory Information

## FCC Part 15 Compliance Statement

This product has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning this equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Change the direction of the radio or TV antenna.
- To the extent possible, relocate the radio, TV, or other receiver away from the product.
- Plug the product into a different electrical outlet so that the product and the receiver are on different branch circuits.

If these suggestions don't help, consult your dealer or an experienced radio/TV repair technician for more suggestions.

**NOTE** This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**CAUTION** If you make any modification to the equipment not expressly approved by Intel, you could void your authority to operate the equipment.

## Canada Compliance Statement (Industry Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications. This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

## Manufacturer Declaration

This certifies that the Intel® Express 530T Switch complies with the EU Directive 89/336/EEC, using the EMC standards EN55022 (Class A) and EN55024. This product also meets or exceeds EN 60950 (safety) requirements. These products have been tested and verified to meet CISPR 22 Class A requirements.

## Australia Statement



## Taiwan Class A EMI Statement

警告使用者：  
這是甲類的資訊產品，在居住的環境中使用時，  
可能會造成射頻干擾，在這種情況下，使用者會  
被要求採取某些適當的對策。

## VCCI Statement

### Class A ITE

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

# Warnings

## WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Internal access to Intel® Express 530T Switch intended only for qualified service personnel. Do not remove any covers.

## WARNING

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean and free of airborne particles (other than normal room dust).
- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.

Ensure that the system is disconnected from its power source and from all telecommunications links, networks, or modems lines whenever the chassis cover is to be removed. Do not operate the system with the cover removed.

**AVERTISSEMENT**

Le système a été conçu pour fonctionner dans un cadre de travail normal. L'emplacement choisi doit être:

- Propre et dépourvu de poussière en suspension (sauf la poussière normale).
- Bien aéré et loin des sources de chaleur, y compris du soleil direct.
- A l'abri des chocs et des sources de vibrations.
- Isolé de forts champs magnétiques générés par des appareils électriques.
- Dans les régions sujettes aux orages magnétiques il est recommandé de brancher votre système à un suppresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage.
- Muni d'une prise murale correctement mise à la terre.

Ne pas utiliser ni modifier le câble d'alimentation C. A. fourni, s'il ne correspond pas exactement au type requis.

Assurez vous que le système soit débranché de son alimentation ainsi que de toutes les liaisons de télécommunication, des réseaux, et des lignes de modem avant d'enlever le capot. Ne pas utiliser le système quand le capot est enlevé.

**WARNUNG**

Das System wurde für den Betrieb in einer normalen Büroumgebung entwickelt. Der entwickelt. Der Standort sollte:

- sauber und staubfrei sein (Hausstaub ausgenommen);
- gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung);
- keinen Erschütterungen ausgesetzt sein;
- keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen;
- in Regionen, in denen elektrische Stürme auftreten, mit einem Überspannungsschutzgerät verbunden sein; während eines elektrischen Sturms sollte keine Verbindung der Telekommunikationsleitungen mit dem Modem bestehen;
- mit einer geerdeten Wechselstromsteckdose ausgerüstet sein.

Versuchen Sie nicht, das mitgelieferte Netzkabel zu ändern oder zu verwenden, wenn es sich nicht um genau den erforderlichen Typ handelt.

Das System darf weder an eine Stromquelle angeschlossen sein noch eine Verbindung mit einer Telekommunikationseinrichtung, einem Netzwerk oder einer Modem-Leitung haben, wenn die Gehäuseabdeckung entfernt wird. Nehmen Sie das System nicht ohne die Abdeckung in Betrieb.

**AVVERTENZA**

Il sistema è progettato per funzionare in un ambiente di lavoro tipico. Scegliere una postazione che sia:

- Pulita e libera da particelle in sospensione (a parte la normale polvere presente nell'ambiente).
- Ben ventilata e lontana da fonti di calore, compresa la luce solare diretta.
- Al riparo da urti e lontana da fonti di vibrazione.
- Isolata dai forti campi magnetici prodotti da dispositivi elettrici.
- In aree soggette a temporali, è consigliabile collegare il sistema ad un limitatore di corrente. In caso di temporali, scollare le linee di comunicazione dal modem.
- Dotata di una presa a muro correttamente installata.

Non modificare o utilizzare il cavo di alimentazione in c. a. fornito dal produttore, se non corrisponde esattamente al tipo richiesto.

Prima di rimuovere il coperchio del telaio, assicurarsi che il sistema sia scollegato dall'alimentazione, da tutti i collegamenti di comunicazione, reti o linee di modem. Non avviare il sistema senza aver prima messo a posto il coperchio.

**ADVERTENCIAS**

El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar:

- Limpio y libre de partículas en suspensión (salvo el polvo normal)
- Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa.
- Alejado de fuentes de vibración.
- Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos.
- En regiones con frecuentes tormentas eléctricas, se recomienda conectar su sistema a un eliminador de sobrevoltaje y desconectar el módem de las líneas de telecomunicación durante las tormentas.
- Previsto de una toma de tierra correctamente instalada.

No intente modificar ni usar el cable de alimentación de corriente alterna, si no se corresponde exactamente con el tipo requerido.

Asegúrese de que cada vez que se quite la cubierta del chasis, el sistema haya sido desconectado de la red de alimentación y de todos los enlaces de telecomunicaciones, de red y de líneas de módem. No ponga en funcionamiento el sistema mientras la cubierta esté quitada

## Wichtige Sicherheitshinweise

- 1 Bitte lesen Sie sich diese Hinweise sorgfältig durch.
- 2 Heben Sie diese Anleitung für den späteren Gebrauch auf.
- 3 Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
- 4 Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
- 5 Das Gerät ist vor Feuchtigkeit zu schützen.
- 6 Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
- 7 Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
- 8 Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
- 9 Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
- 10 Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
- 11 Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
- 12 Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
- 13 Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
- 14 Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
- 15 Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
  - a Netzkabel oder Netzstecker sind beschädigt.
  - b Flüssigkeit ist in das Gerät eingedrungen.
  - c Das Gerät war Feuchtigkeit ausgesetzt.
  - d Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
  - e Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
  - f Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
- 16 Bei Reparaturen dürfen nur Originalersatzteile bzw. den Originalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschädigung hervorrufen.
- 17 Wenden Sie sich mit allen Fragen die Service und Reparatur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes sicher.
- 18 Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden. Für einen Nennstrom bis 6A und einem Gerätekörpergewicht größer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm<sup>2</sup> einzusetzen.

## Limited Hardware Warranty

Intel warrants to the original owner that the hardware product delivered in this package will be free from defects in material and workmanship for three (3) years following the latter of: (i) the date of purchase only if you register by returning the registration card as indicated thereon with proof of purchase; or (ii) the date of manufacture; or (iii) the registration date if by electronic means provided such registration occurs within thirty (30) days from purchase. This warranty does not cover the product if it is damaged in the process of being installed. Intel recommends that you have the company from whom you purchased this product install the product.

INTEL RESERVES THE RIGHT TO FILL YOUR ORDER WITH A PRODUCT CONTAINING NEW OR REMANUFACTURED COMPONENTS. THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF NONINFRINGEMENT OF INTELLECTUAL PROPERTY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY ARISING OUT OF ANY PROPOSAL, SPECIFICATION, SAMPLE OR OTHERWISE.

This warranty does not cover replacement of products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation or improper testing. If the product is found to be otherwise defective, Intel, at its option, will replace or repair the product at no charge except as set forth below, provided that you deliver the product along with a return material authorization (RMA) number either to the company from whom you purchased it or to Intel (North America only). If you ship the product, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge. Intel may replace or repair the product with either new or remanufactured product or parts, and the returned product becomes Intel's property. Intel warrants the repaired or replaced product to be free from defects in material and workmanship for a period of the greater of: (i) ninety (90) days from the return shipping date; or (ii) the period of time remaining on the original three (3) year warranty.

This warranty gives you specific legal rights and you may have other rights which vary from state to state. All parts or components contained in this product are covered by Intel's limited warranty for this product; the product may contain fully tested, recycled parts, warranted as if new. For warranty information call one of the numbers below.

### Returning a Defective Product (RMA)

Before returning any product, contact an Intel Customer Support Group and obtain an RMA number by calling:

- **North America only:** (916) 377-7000
- **Other locations:** Return the product to the place of purchase.

If the Customer Support Group verifies that the product is defective, they will have the Return Material Authorization Department issue you an RMA number to place on the outer package of the product. Intel cannot accept any product without an RMA number on the package.

### LIMITATION OF LIABILITY AND REMEDIES

INTEL SHALL HAVE NO LIABILITY FOR ANY INDIRECT OR SPECULATIVE DAMAGES (INCLUDING, WITHOUT LIMITING THE FOREGOING, CONSEQUENTIAL, INCIDENTAL AND SPECIAL DAMAGES) ARISING FROM THE USE OF OR INABILITY TO USE THIS PRODUCT, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, TORT, OR UNDER ANY WARRANTY, IRRESPECTIVE OF WHETHER INTEL HAS ADVANCE NOTICE OF THE POSSIBILITY OF ANY SUCH DAMAGES, INCLUDING, BUT NOT LIMITED TO LOSS OF USE, INFRINGEMENT OF INTELLECTUAL PROPERTY, BUSINESS INTERRUPTIONS, AND LOSS OF PROFITS, NOTWITHSTANDING THE FOREGOING, INTEL'S TOTAL LIABILITY FOR ALL CLAIMS UNDER THIS AGREEMENT SHALL NOT EXCEED THE PRICE PAID FOR THE PRODUCT. THESE LIMITATIONS ON POTENTIAL LIABILITIES WERE AN ESSENTIAL ELEMENT IN SETTING THE PRODUCT PRICE. INTEL NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME FOR IT ANY OTHER LIABILITIES.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

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**Software:** Software provided with the hardware product is not covered under the hardware warranty described above. See the applicable software license agreement which shipped with the hardware product for details on any software warranty.

## Limited Hardware Warranty (Europe only)

Intel warrants to the original owner that the hardware product delivered in this package will be free from defects in material and workmanship for three (3) years following the latter of: (i) the date of purchase only if you register by returning the registration card as indicated thereon with proof of purchase; or (ii) the date of manufacture; or (iii) the registration date if by electronic means provided such registration occurs within thirty (30) days from purchase. This warranty does not cover the product if it is damaged in the process of being installed. Intel recommends that you have the company from whom you purchased this product install the product.

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This warranty does not cover replacement of products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation or improper testing. If the product is found to be otherwise defective, Intel, at its option, will replace or repair the product at no charge except as set forth below, provided that you deliver the product along with a return material authorization (RMA) number either to (a) the company from whom you purchased it or (b) to Intel, North America only (if purchased in Europe you must deliver the product to "(a)"). If you ship the product, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge. Intel may replace or repair the product with either new or remanufactured product or parts, and the returned product becomes Intel's property. Intel warrants the repaired or replaced product to be free from defects in material and workmanship for a period of the greater of: (i) ninety (90) days from the return shipping date; or (ii) the period of time remaining on the original three (3) year warranty.

This warranty gives you specific legal rights and you may have other rights which vary from state to state. All parts or components contained in this product are covered by Intel's limited warranty for this product; the product may contain fully tested, recycled parts, warranted as if new. For warranty information call one of the numbers below.

### Returning a Defective Product (RMA)

Before returning any product, contact an Intel Customer Support Group and obtain an RMA number by calling the non-toll free numbers below:

Country	Number	Language
France	+33 (0) 1 41 91 85 29	French
Germany	+49 (0) 69 9509 6099	German
Italy	+39 (0) 2 696 33276	Italian
UK	+44 (0) 870 607 2439	English

If the Customer Support Group verifies that the product is defective, they will have the Return Material Authorization Department issue you an RMA number to place on the outer package of the product. Intel cannot accept any product without an RMA number on the package.

### LIMITATION OF LIABILITY AND REMEDIES

INTEL SHALL HAVE NO LIABILITY FOR ANY INDIRECT OR SPECULATIVE DAMAGES (INCLUDING, WITHOUT LIMITING THE FOREGOING, CONSEQUENTIAL, INCIDENTAL AND SPECIAL DAMAGES) ARISING FROM THE USE OF OR INABILITY TO USE THIS PRODUCT, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, TORT, OR UNDER ANY WARRANTY, IRRESPECTIVE OF WHETHER INTEL HAS ADVANCE NOTICE OF THE POSSIBILITY OF ANY SUCH DAMAGES, INCLUDING, BUT NOT LIMITED TO LOSS OF USE, INFRINGEMENT OF INTELLECTUAL PROPERTY, BUSINESS INTERRUPTIONS, AND LOSS OF PROFITS, NOTWITHSTANDING THE FOREGOING, INTEL'S TOTAL LIABILITY FOR ALL CLAIMS UNDER THIS AGREEMENT SHALL NOT EXCEED THE PRICE PAID FOR THE PRODUCT. THESE LIMITATIONS ON POTENTIAL LIABILITIES WERE AN ESSENTIAL ELEMENT IN SETTING THE PRODUCT PRICE. INTEL NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME FOR IT ANY OTHER LIABILITIES.

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**Software:** Software provided with the hardware product is not covered under the hardware warranty described above. See the applicable software license agreement which shipped with the hardware product for details on any software warranty.

This limited hardware warranty shall be governed by and construed in accordance with the laws of England and Wales. The courts of England shall have exclusive jurisdiction regarding any claim brought under this warranty.

## Limitation de garantie du matériel (Europe)

Intel garantit au propriétaire original que le produit matériel livré dans le présent coffret est exempt de défaut matériel ou de fabrication pour une période de trois (3) ans à compter de la plus récente des dates suivantes : (i) la date d'achat uniquement si vous vous êtes inscrit en renvoyant la carte d'inscription de la façon indiquée, avec une preuve d'achat ; (ii) la date de fabrication ou (iii) la date d'inscription électronique à condition qu'elle ait lieu dans les 30 jours suivant l'achat. La présente garantie sera nulle si le produit matériel est endommagé lors de son installation. Intel recommande de faire installer le produit matériel par la société auprès de laquelle il a été acheté.

INTEL SE RESERVE LE DROIT DE VOUS LIVRER UN PRODUIT CONTENANT DES COMPOSANTS NOUVEAUX OU REPARÉS. CETTE GARANTIE REMPLACE TOUTES LES AUTRES GARANTIES, EXPRESSES, TACITES OU LEGALES, Y COMPRIS, MAIS SANS QUE CETTE ENUMERATION SOIT LIMITATIVE, LES GARANTIES CONCERNANT LE NON RESPECT DE LA PROPRIETE INTELLECTUELLE, LA QUALITE SATISFAISANTE, L'ADEQUATION POUR UN USAGE PARTICULIER, OU TOUTE AUTRE GARANTIE ISSUE DE TOUT AUTRE PROPOSITION, SPECIFICATION, ECHANTILLON OU AUTRE.

La présente garantie ne couvre pas le remplacement de produits matériels endommagés par abus, accident, mauvaise utilisation, négligence, altération, réparation, catastrophe, installation ou tests incorrects. Si le produit matériel s'avère défectueux pour une autre raison, Intel décidera de le remplacer ou de le réparer gratuitement, à l'exception des cas énumérés ci-après, à condition que le produit soit renvoyé avec un numéro d'autorisation de retour du matériel (ARM) à (a) la société auprès de laquelle il a été acheté ou (b) à Intel, en Amérique du Nord seulement (si l'achat a eu lieu en Europe vous devez le renvoyer à "(a)". Si vous expédiez le produit matériel, vous devez assumer le risque de dégâts ou de perte pendant le transport. Vous devez utiliser le coffret original (ou l'équivalent) et payer les frais de transport. Intel peut réparer le produit matériel ou le remplacer par un produit neuf ou remis à neuf, le produit renvoyé devenant la propriété d'Intel. Intel garantit que le produit matériel réparé ou de remplacement est exempt de défaut matériel ou de fabrication pendant la plus longue des périodes suivantes: (i) quatre-vingt-dix (90) jours à compter de la date de retour; ou (ii) la période encore couverte par la garantie originale de trois (3) ans.

La présente garantie vous accorde des droits juridiques spécifiques et vous pouvez également disposer d'autres droits variant d'un Etat à l'autre. Tous les composants ou pièces du produit matériel sont couverts par la garantie limitée d'Intel relative à ce dernier ; il peut contenir des pièces recyclées, entièrement testées et garanties comme neuves. Pour plus d'informations sur la garantie,appelez l'un des numéros énumérés ci-après.

Retour d'un produit défectueux (ARM)

Avant de retourner un produit matériel, contactez le service d'assistance à la clientèle Intel pour obtenir un numéro ARM.

Pays	Numéro	Langue
France	+33 (0) 1 41 91 85 29	Français
Allemagne	+49 (0) 69 9509 6099	Allemand
Italie	+39 (0) 2 696 33276	Italien
R.U.	+44 (0) 870 607 2439	Anglais

Si le service d'assistance confirme que le produit est défectueux, il demandera au Département d'autorisation de retour de matériel de vous attribuer un numéro ARM à indiquer sur l'emballage externe. Intel ne peut accepter aucun produit sans numéro ARM.

### LIMITATION DE RESPONSABILITE ET DE RECOURS

INTEL DECLINE TOUTE RESPONSABILITE RELATIVE A DES DOMMAGES INDIRECTS OU SPECULATIFS (Y COMPRIS, SANS LIMITATION DES ELEMENTS CI-DESSUS, LES DOMMAGES CONSECUITIFS, ACCIDENTELS ET SPECIAUX) DECOULANT DE L'UTILISATION OU DE L'INCAPACITE D'UTILISER CE PRODUIT, DUS A UN CONTRAT, UNE NEGLIGENCE, UN TORT OU COUVERTS PAR TOUTE GARANTIE, MEME SI LA POSSIBILITE D'UN TEL DOMMAGE A DEJA ETE PORTEE A LA CONNAISSANCE D'INTEL, Y COMPRIS, MAIS SANS QUE CETTE ENUMERATION SOIT LIMITATIVE, UNE PRIVATION DE JOUISSANCE, UN NON RESPECT DE LA PROPRIETE INTELLECTUELLE, UNE INTERRUPTION DES ACTIVITES ET UN MANQUE A GAGNER. NONOBSTANT LA DECLARATION QUI PRECEDE, LA RESPONSABILITE GLOBALE DE INTEL CONCERNANT TOUS LES LITIGES RELATIFS AU PRESENT ACCORD NE SERA PAS SUPERIEURE AU PRIX PAYE POUR LE PRODUIT. CES LIMITATIONS DE RESPONSABILITE POTENTIELLE ONT CONSTITUE UN FACTEUR DETERMINANT LORS DE LA FIXATION DU PRIX DU PRODUIT. INTEL N'ASSUME AUCUNE AUTRE RESPONSABILITE ET N'AUTORISE QUICONQUE A LE FAIRE EN SON NOM.

**Applications de contrôle critique:** Intel décline toute responsabilité en cas d'utilisation du produit matériel dans le cadre d'applications de contrôle critique (y compris et pour ne citer que des exemples, les systèmes de contrôle de sécurité ou de services médicaux, les systèmes de contrôle d'énergie nucléaire, ou de trafic terrestre ou aérien) par le licencié ou le sous-licencié, l'utilisateur encourt entièrement les risques d'une telle utilisation. Le titulaire de la licence accepte de défendre, d'indemniser et de garantir Intel de toute réclamation survenant par suite de l'utilisation du produit matériel dans de telles applications par le licencié ou le sous-licencié.

**Logiciel:** Le logiciel fourni avec le produit matériel n'est pas couvert par la garantie du matériel décrite ci-dessus. Consultez l'accord de licence du logiciel qui accompagne le produit matériel pour obtenir des détails sur la garantie du logiciel.

La garantie limitée du matériel est régie et interprétée par les lois en vigueur en Angleterre et au Pays de Galles. Les tribunaux anglais jouissent d'une juridiction exclusive en matière de litige concernant cette garantie.

## Garanzia limitata sull'hardware (valida solo in Europa)

Intel garantisce al proprietario originale che il prodotto hardware incluso in questo pacchetto è privo di difetti in materiale e in lavorazione per un periodo di tre (3) anni a partire dall'ultima data tra: (i) la data di acquisto, solo nel caso in cui l'utente effettua la registrazione tramite la scheda di registrazione, come indicato, accompagnata dalla prova di acquisto; oppure (ii) la data di fabbricazione; oppure (iii) la data di registrazione, se effettuata per via elettronica, a condizione che tale registrazione avvenga entro trenta (30) giorni dall'acquisto. Questa garanzia non copre il prodotto nel caso questo fosse danneggiato durante l'installazione. Intel raccomanda di fare installare il prodotto dall'azienda da cui il prodotto è stato acquistato.

**INTEL SI RISERVA IL DIRITTO DI ONORARE L'ORDINAZIONE CON UN PRODOTTO CONTENENTE PARTI NUOVE O RIFABBRICATO. LA GARANZIA QUI SOPRA SOSTITUISCE QUALSIASI ALTRA GARANZIA, SIA QUELLA ESPlicita, IMPLICITA O STATUTORIA, INCLUSO, MA NON LIMITATO A, QUALSIASI GARANZIA DI NON VIOLAZIONE DI PROPRIETÀ INTELLETTUALE, QUALITÀ SODDISFACENTE, IDONEITÀ A QUALSIASI SCOPO PARTICOLARE O QUALSIASI GARANZIA DERIVANTE DA PROPOSTA, SPECIFICAZIONI, CAMPIONI O ALTRO.**

Questa garanzia non include la sostituzione di prodotti danneggiati a causa di abuso, incidente, uso inappropriato, negligenza, alterazione, riparazione, disastro, installazione o controllo inadeguati. Se il prodotto viene considerato difettoso per altri motivi, Intel, a sua discrezione, sostituirà o riparerà il prodotto, a proprie spese, eccetto nei casi qui sotto menzionati, a condizione che il prodotto venga consegnato congiuntamente al numero di autorizzazione per la restituzione del materiale (RMA, Return Material Authorization) (a) all'azienda da cui si è acquistato il prodotto, oppure (b) a Intel, solo quando in Nord America (se il prodotto è stato acquistato in Europa, sarà necessario consegnare il prodotto seguendo le modalità indicate in "(a)"). Se il prodotto viene inviato, il mittente si assume la responsabilità in caso di danni o di perdita durante il tragitto. È necessario utilizzare l'imballaggio originale del prodotto (o un suo equivalente) e pagare le spese di spedizione. Intel sostituirà o riparerà il prodotto (o la parte) con uno nuovo o uno rifabbricato, e il prodotto restituito diventerà proprietà di Intel. Intel garantisce che il prodotto riparato o sostituito sarà privo di difetti in materiale e in lavorazione per un periodo comunque non superiore: (i) a novanta (90) giorni dalla data di spedizione all'utente; oppure (ii) al periodo rimanente nella garanzia originale di tre (3) anni. Questa garanzia dà all'utente diritti legali specifici; potrebbero esistere altri diritti, variabili da stato a stato. Tutte le parti e i componenti contenuti in questo prodotto sono coperti dalla garanzia limitata di Intel relativa a questo prodotto; il prodotto potrebbe contenere parti riciclate, completamente collaudate e garantite come nuove. Per maggiori informazioni sulla garanzia, chiamare uno dei numeri indicati qui sotto.

### Restituzione di prodotti difettosi (RMA)

Prima di restituire un prodotto, contattare l'assistenza tecnica di Intel e richiedere un numero RMA; i numeri verdi sono qui sotto elencati:

Paese	Numero	Lingua
Francia	+33 (0) 1 41 91 85 29	Francese
Germania	+49 (0) 69 9509 6099	Tedesco
Italia	+39 (0) 2 696 33276	Italiano
Regno Unito	+44 (0) 870 607 2439	Inglese

Se il gruppo di supporto alla clientela determina che il prodotto è difettoso, richiederà l'emissione di un numero di autorizzazione per la restituzione del materiale (RMA) da porre all'esterno dell'imballaggio del prodotto. Intel non accetterà prodotti sprovvisti di tale numero visibile sull'imballaggio.

### LIMITAZIONI DI RESPONSABILITÀ E REMEDI

INTEL NON POTRÀ ESSERE CONSIDERATA RESPONSABILE DI ALCUN DANNO, DIRETTO O SPECULATIVO (INCLUSI, SENZA LIMITAZIONI COME INDICATO IN PRECEDENZA, I DANNI CONSEGUenzIALI, INCIDENTALI E SPECIALI) DERIVANTI DALL'USO O DALLA IMPOSSIBILITÀ DI UTILIZZARE QUESTO PRODOTTO, PER MOTIVI NON CONTEMPLATI NEL CONTRATTO, O DOVUTI A NEGLIGENZA, TORTO O SOTTO QUALSIASI GARANZIA, INDIPENDENTEMENTE DAL FATTO CHE INTEL SIA A CONOSCENZA O meno DELLA POSSIBILITÀ DI TALI DANNI, INCLUSI, MA NON LIMITATI ALLA PERDITA D'USO, VIOLAZIONE DI PROPRIETÀ INTELLETTUALE, INTERRUZIONI D'AFFARI E PERDITA DI PROFITTI, NONOSTANTE QUANTO DETTO IN PRECEDENZA, LA RESPONSABILITÀ totale DI INTEL NEI CONFRONTI DEI RECLAMI, SECONDO QUESTO ACCORDO, NON ECCEDE IL PREZZO PAGATO PER IL PRODOTTO. QUESTE LIMITAZIONI SULLE RESPONSABILITÀ POTENzIALI SONO STATE FATTORE DECISIVO NELLA DETERMINAZIONE DEL PREZZO DEL PRODOTTO. INTEL NON ASSUME, NE AUTORIZZA ALCUNO AD ASSUMERE PER SÉ, NESSUN'ALTRA RESPONSABILITÀ.

**Applicazioni di controllo di situazioni critiche:** Intel disconosce specificatamente la responsabilità nel caso di uso dell'hardware in applicazioni di controllo di situazioni critiche (inclusi, al solo scopo di esempio, sistemi di controllo della sicurezza o della salute, dell'energia nucleare, o sistemi di controllo aereo o terrestre) da parte dei licenziatari o dei sottolicenziatari, e tale uso fa parte completamente del rischio intrapreso dall'utente. Il licenziatario è d'accordo nel difendere, indemnizzare e liberare Intel da ogni reclamo risultante dall'uso del prodotto hardware in tale applicazioni da parte del licenziatario o del sottolicenziatario.

**Software:** il software accluso al prodotto hardware non è coperto dalla garanzia dell'hardware sopra descritta. Per maggiori dettagli sulla garanzia del software, vedere l'accordo di licenza relativo al software, inviato assieme al prodotto hardware.

Questa garanzia limitata dell'hardware è governata da, ed è conforme a, le leggi di Inghilterra e Galles. Il tribunale di Inghilterra avrà la completa giurisdizione su qualsiasi reclamo presentato sotto questa garanzia.

**Beschränkte Hardwaregarantie (Nur für Europa)**

Intel garantiert dem ursprünglichen Eigentümer, daß die in diesem Paket enthaltene Hardware keine Material- oder Herstellungsfehler aufweist. Diese Garantie gilt für drei (3) Jahre (a) nach dem Kaufdatum, wenn die ausgefüllte Registrierungskarte entsprechend den darauf enthaltenen Angaben zusammen mit einem Kaufnachweis eingesendet wurde; oder (b) nach dem Herstellungsdatum; oder (c) nach dem Registrierungsdatum, wenn die Registrierung innerhalb von 30 Tagen auf elektronischem Weg durchgeführt wird. Diese Garantie entfällt, wenn die Hardware bei der Installation beschädigt wird. Intel empfiehlt, die Installation durch den Verkäufer der Hardware durchführen zu lassen.

**INTEL BEHÄLT SICH DAS RECHT VOR, IHREN AUFTRAG MIT EINEM PRODUKT ZU ERFÜLLEN, DAS NEUE ODER ERNEUERTE KOMPONENTEN ENTHÄLT. OBIGE GARANTIE GILT ANSTELLE ALLER ANDEREN AUSDRÜCKLICHEN, STILLSCHWEIGENDEN ODER GESETZLICH FESTGELEGTEN GARANTIEN. AUSGESCHLOSSEN SIND DAMIT AUCH UNTER ANDEREM ALLE GARANTIEN FÜR DIE VERKEHRSFAHIGKEIT, DIE VERLETZUNG DER RECHTE VON DRITTEN, DIE EIGNUNG FÜR EINEN BESTIMMTEN ZWECK ODER GARANTIEN, DIE IM ZUSAMMENHANG MIT EINEM ANGEBOT, EINER SPEZIFIKATION ODER EINEM MUSTER GEGEBEN WURDEN.**

Diese Garantie schließt den Hardware-Ersatz bei Beschädigung aufgrund von Mutwilligkeit, Unfall, falscher Verwendung, Fahrlässigkeit, Umänderung, Reparatur, Katastrophen, falscher Installation oder unvorschriftsmäßigem Testen aus. Wenn das Hardwareprodukt aus anderen Gründen beschädigt ist, liegt die Entscheidung bei Intel, ob die Hardware mit Ausnahme der im folgenden beschriebenen Einschränkungen kostenlos ersetzt oder repariert wird. Hierzu müssen Sie das Produkt zusammen mit einer Rückgabenummer (RMA-Nummer, siehe unten) entweder (a) an den Verkäufer des Produkts oder (b) an Intel zurücksenden (bei Kauf in Europa muß das Produkt an "(a)" geliefert werden). Das Risiko des Verlusts oder der Beschädigung während des Transports liegt bei Ihnen als Käufer. Sie müssen zum Versenden die Originalverpackung (oder einen gleichwertigen Ersatz) verwenden und die Versandkosten übernehmen. Intel ersetzt die Hardware entweder durch ein neues oder ein neuwertiges Produkt. Das zurückgegebene Hardwareprodukt wird Eigentum von Intel. Intel garantiert, daß das reparierte oder ersetzte Hardwareprodukt für einen Zeitraum von: (i) neunzig (90) Tagen ab Rückgabedatum oder (ii) für die verbleibende Zeit der ursprünglichen Garantie von drei (3) Jahren frei von Material- und Herstellungsfehlern ist. Dabei gilt jeweils der längere Zeitraum.

Mit dieser Garantie erhalten Sie bestimmte Rechte, die je nach Staat durch weitere Rechte ergänzt werden können. Alle Teile oder Komponenten dieses Hardwareprodukts werden durch die beschränkte Hardwaregarantie von Intel abgedeckt. Das Hardwareprodukt kann vollständig getestete, wiederverwendete Teile enthalten, die derselben Garantie wie neue Produkte unterliegen. Informationen zur Garantie erhalten Sie unter einer der Intel Kundendienstnummern, die am Ende dieses Handbuchs zu finden sind.

Rückgabe eines beschädigten Produkts (RMA)

Bevor Sie ein Hardwareprodukt zurücksenden, sollten Sie sich vom Intel Kundendienst eine sogenannte RMA-Nummer zuweisen lassen, indem Sie eine der folgenden gebührenpflichtigen Telefonnummern anrufen:

Land	Telefon	Sprache
Frankreich	+33 (0) 1 41 91 85 29	Französisch
Deutschland	+49 (0) 69 9509 6099	Deutsch
Italien	+39 (0) 2 696 33276	Italienisch
GB	+44 (0) 870 607 2439	Englisch

Nachdem die Beschädigung vom Kundendienst bestätigt worden ist, wird von der zuständigen Abteilung eine Rückgabenummer (RMA-Nummer) ausgegeben, die auf der äußeren Verpackung der Hardware angebracht werden muß. Intel akzeptiert kein Produkt ohne RMA-Nummer auf der Verpackung.

Haftungsbeschränkung und Rechtsmittel

**INTEL HAFTET NICHT FÜR INDIREKTE ODER SPEKULATIVE SCHÄDEN (EINSCHLIESSLICH ALLER FOLGESCHÄDEN SOWIE ALLER ZUFÄLLIGEN UND BESONDEREN SCHÄDEN), DIE DURCH DIE VERWENDUNG ODER NICHTVERWENDBARKEIT DIESES PRODUKTS ENTSTEHEN, SEI DIES IM ZUSAMMENHANG MIT EINER VERTRÄGLICHEN VERPFLICHTUNG, AUFGRUND VON FAHRLÄSSIGKEIT, DURCH UNERLAUBTE HANDLUNGEN ODER IM RAHMEN EINER GARANTIE. DIES GILT AUCH FÜR FÄLLE, IN DENEN INTEL ÜBER DIE MÖGLICHKEIT SOLCHER SCHÄDEN, DIE SICH UNTER ANDEREM DURCH NUTZUNGSAUFSÄLLE, BETRIEBSUNTERBRECHUNGEN UND GEWINNVERLUSTE ERGEBEN KÖNNEN, IN KENNTNIS GESETZT WURDE.**

UNGEACHTET DER GEWÄHRTEN GARANTIE ÜBERSTEIGT DIE HAFTUNG VON INTEL IM RAHMEN DIESER VEREINBARUNG IN KEINEM FALL DEN KAUFPREIS DES HARDWAREPRODUKTS. DIESE HAFTUNGSBESCHRÄNKUNG IST EIN WESENTLICHER FAKTOR BEI DER FESTLEGUNG DES PREISES FÜR DAS HARDWAREPRODUKT. INTEL ÜBERNIMMT KEINE WEITERE HAFTUNG UND ERTEILT DRITTEN KEINERLEI BEFUGNIS, FÜR INTEL EINE WEITERE HAFTUNG ZU ÜBERNEHMEN.

**Steuer- und Überwachungsanwendung von hoher Wichtigkeit:** Intel schließt insbesondere die Haftung bei der Verwendung des Hardwareprodukts mit Steueranwendungen von hoher Wichtigkeit (z.B. Sicherheits- und Krankenversicherungssysteme, Steuersysteme für Nuklearanlagen sowie Verkehrsüberwachungssysteme für Boden- und Luftverkehr) durch den Lizenznehmer oder Unterlizenznachnehmer ab, und eine derartige Verwendung liegt ausschließlich in der Verantwortung des Benutzers. Der Lizenznehmer erklärt sich bereit, Intel zu verteidigen und schadlos zu halten bezüglich aller Klagen, die aus der Verwendung eines Hardwareprodukts für solche Zwecke vom Lizenznehmer oder Unterlizenznachnehmern erhoben werden.

**Software:** Die mit diesem Hardwareprodukt gelieferte Software wird von der oben beschriebenen Hardwaregarantie nicht abgedeckt. Bitte lesen Sie die entsprechende Softwarelizenzvereinbarung, die mit dem Hardwareprodukt geliefert wurde, um genaue Informationen zur Softwaregarantie zu erhalten.

Diese eingeschränkte Hardwaregarantie unterliegt den Gesetzen von England und Wales. Die englischen Gerichte sind Gerichtsstand für alle Klagen, die im Rahmen der Garantie erhoben werden.

## **Garantía limitada de hardware (solo para Europa)**

Intel garantiza al propietario original que el producto de hardware entregado en este paquete no tendrá defectos de materiales ni fabricación durante tres (3) años contados a partir de la fecha que resulte más reciente de entre las opciones siguientes: (i) la fecha de compra, sólo si devuelve la tarjeta de registro con prueba de compra de la forma indicada al respecto para registrarse; o bien (ii) la fecha de fabricación; o (iii) la fecha de registro, si éste se ha producido por medios electrónicos y dentro de los treinta (30) días siguientes a la compra. Esta garantía no cubre los daños sufridos por el producto durante el proceso de instalación. Intel recomienda que sea la empresa a la que adquirió el producto la que se encargue de su instalación.

**INTEL SE RESERVA EL DERECHO DE CUMPLIMENTAR EL PEDIDO CON UN PRODUCTO QUE CONTENGA COMPONENTES NUEVOS O REFRABRICADOS. LA GARANTÍA ANTERIOR PREVALECE SOBRE CUALQUIER OTRA GARANTÍA, YA SEA EXPLÍCITA, IMPLÍCITA O REGLAMENTARIA, INCLUIDAS, SIN LIMITACIÓN, CUALESQUIERA GARANTÍAS DE NO INFRINGIMIENTO DE LA PROPIEDAD INTELECTUAL, CALIDAD SATISFACTORIA, ADECUACIÓN PARA UNA FINALIDAD DETERMINADA O CUALQUIER GARANTÍA SURGIDA DE CUALQUIER PROPUESTA, ESPECIFICACIÓN, MUESTRA O DE OTRA CLASE.**

Esta garantía no cubre la sustitución de productos dañados por abuso, accidente, mal uso, negligencia, alteración, reparación, desastre, instalación incorrecta o pruebas incorrectas. Si el producto tuviera cualquier otro defecto, Intel se reserva la opción de reemplazar o reparar el producto sin cargo alguno, excepto los descritos a continuación, siempre que el producto se entregue con un número de autorización de devolución de material (RMA), a (a) la empresa a la que se adquirió o (b) a Intel, sólo en América del Norte (si lo adquirió en Europa, debe entregar el producto a "(a)"). Si envía el producto, debe asumir el riesgo de daños o pérdida en el transporte. Debe utilizar el embalaje original (o equivalente) y costear los gastos de envío. Intel puede reemplazar o reparar el producto con piezas o productos nuevos o refabricados, y el producto devuelto pasa a ser propiedad de Intel. Intel garantiza que el producto reparado o reemplazado no tendrá defectos materiales ni de fabricación durante el periodo que resulte mayor de los siguientes: (i) noventa (90) días desde la fecha de envío; o (ii) el periodo de tiempo restante de la garantía original de tres (3) años.

Esta garantía le otorga derechos legales concretos y puede tener otros derechos que varían según la jurisdicción. Todas las piezas o componentes que contiene este producto están cubiertos por la garantía limitada de Intel sobre este producto; el producto puede contener piezas recicladas, completamente comprobadas, garantizadas como si de piezas nuevas se tratase. Si desea obtener más información sobre la garantía, puede llamar a uno de los números indicados a continuación.

### Devolución de productos defectuosos (RMA)

Antes de devolver cualquier producto, póngase en contacto con el grupo de Asistencia al cliente de Intel y obtenga un número RMA en uno de los siguientes números no gratuitos:

País	Número	Idioma
Francia	+33 (0) 1 41 91 85 29	Francés
Alemania	+49 (0) 69 9509 6099	Alemán
Italia	+39 (0) 2 696 33276	Italiano
Reino Unido	+44 (0) 870 607 2439	Inglés

Si el grupo de Asistencia al cliente comprueba que el producto es defectuoso, se podrá en contacto con el Departamento de autorización de devolución de material para que éste le envíe un número RMA que debe colocar en el envoltorio externo del producto. Intel no puede aceptar productos sin el número RMA en el paquete.

### LIMITACIÓN DE RESPONSABILIDAD Y REPARACIONES

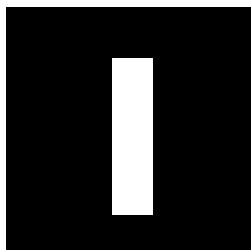
INTEL NO SERÁ RESPONSABLE DE NINGÚN DAÑO INDIRECTO O ESPECULATIVO (INCLUIDOS, SIN LIMITAR A LOS ANTERIORES, LOS DAÑOS INDIRECTOS, INCIDENTALES Y ESPECIALES) PRODUCIDO POR EL USO O POR LA IMPOSIBILIDAD DEL USO DE ESTE PRODUCTO, YA PROVENGA DE CONTRATO, NEGLIGENCIA, AGRAVIO O BAJO CUALQUIER GARANTÍA, SIN IMPORTAR QUE INTEL HAYA RECIBIDO PREVIO AVISO DE LA POSIBILIDAD DE DICHOS DAÑOS, INCLUIDOS, AUNQUE NO LIMITADOS A, PÉRDIDAS DE USO, INFRINGIMIENTO DE LA PROPIEDAD INTELECTUAL, SUSPENSIÓN DEL EJERCICIO COMERCIAL Y PÉRDIDA DE BENEFICIOS, A PESAR DE LO ANTERIOR, TODA LA RESPONSABILIDAD DE INTEL SOBRE LAS RECLAMACIONES REALIZADAS BAJO ESTE ACUERDO NO EXCEDERÁ EL PRECIO PAGADO POR EL PRODUCTO. ESTAS LIMITACIONES SOBRE LAS RESPONSABILIDADES POTENCIALES HAN CONSTITUIDO UN ELEMENTO ESENCIAL A LA HORA DE DETERMINAR EL PRECIO DEL PRODUCTO. INTEL NO ASUME NI AUTORIZA QUE NINGUNA PERSONA ASUMA EN SU LUGAR NINGUNA OTRA RESPONSABILIDAD.

**Aplicaciones de control crítico:** Intel deniega específicamente la responsabilidad por el uso del producto de hardware en aplicaciones de control crítico (incluidos, sólo a modo de ejemplo, los sistemas de seguridad o atención sanitaria, sistemas de control de energía nuclear o sistemas de control de tráfico aéreo o rodado) por Receptores o Subreceptores de la Licencia, y dicho uso queda enteramente a riesgo del usuario. El Receptor de la Licencia acuerda defender, indemnizar y mantener la inocencia de Intel por y contra toda reclamación surgida del uso del producto de hardware en tales aplicaciones por parte del Receptor o Subreceptor de la Licencia.

**Software:** El software proporcionado con el producto de hardware no está cubierto por la garantía de hardware descrita anteriormente. Si desea obtener información detallada sobre las garantías de software, consulte el acuerdo de licencia correspondiente al software incluido con el producto de hardware.

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